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Diplomová práce

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Rytmické rozdíly mezi velšskou angličtinou a britským standardem

Rhythmic Differences between Welsh English and the British Standard

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‘*A phonetician has to have more talents than I have.*’

Ladefoged 1967: preface.

Prohlašuji, že jsem diplomovou práci vypracovala samostatně a že jsem uvedla všechny použité prameny a literaturu. Souhlasím s tím, aby moje diplomová práce byla půjčována ke studijním účelům. V Praze dne 2. 8. 2012. .....

I declare that the following MA thesis is my own work for which I used only the sources and literature mentioned. I have no objections to the MA thesis being borrowed and used for study purposes.

Abstract

The present thesis deals with rhythmic differences between Welsh English and the British Standard. It focuses on the varieties spoken in Cardiff and Aberystwyth in particular.

The first part of the theoretical chapter summarises the approaches towards rhythm from the physiological, acoustic, perceptual, and phonological perspectives. The second part provides a basic description of the British Standard, Welsh, and Welsh English. It concerns itself with the existing information related to the subject matter especially as regards Welsh varieties of English. The last, third part, serves as an overview of the most common approaches towards the search of the acoustic correlates of rhythm (%V, ΔC, ΔV, PVI, varco, RR, YARD).

The following chapters of the thesis present a material based study of the data obtained for the purposes of the thesis. The segmentation was carried out according to the principles proposed by Machač and Skarnitzl 2009. Rhythm was measured for four respondents for each selected location of Wales. The age span was 35-39 years for the group from Cardiff and 29-39 for that from Aberystwyth. The values measured were compared with the research of Volín and Pollák from 2009, which, among other things, provided the results of the rhythmic values for %V and ΔC for the British Standard on the basis of the same text that was used during collecting the data for this thesis.

The Welsh varieties of English of the eight respondents have turned out to exhibit values for %V and ΔC rather similar to the speakers of the British Standard. In general, the results would appear to suggest that the existing approaches to rhythm are not indicators sensitive enough for dialectological differences, with the exception of nPVI-v.

The recordings obtained for this study also serve as a basis for a corpus of Aberystwyth varieties of English.

Key words: *rhythm, British Standard / Received Pronunciation, Welsh English, Cardiff, Aberystwyth*

Abstrakt

Tato práce se zabývá rytmickými rozdíly mezi velšskou angličtinou a britským standardem. Úžeji se specializuje na varianty měst Cardiff a Aberystwyth.

Teoretická kapitola v první části shrnuje přístupy k rytmu z hlediska fyziologického, akustického, percepčního a fonologického. Druhá část poskytuje stručný popis britského standardu, velštiny a velšských angličtin a věnuje se dosavadním poznatkům týkající se dané problematiky obzvláště ve velšských nářečích angličtiny. Poslední, třetí část, slouží jako přehled základních přístupů k hledání akustických korelátů rytmu (%V, ΔC, ΔV, PVI, varco, RR, YARD).

Zbylé kapitoly práce se věnují materiálové studii, pro niž byly obstarány příslušné nahrávky. Segmentace byla provedena na bázi segmentačních pravidel navržených Machačem a Skarnitzlem 2009. Pro velšské mluvčí byl rytmus zkoumán na čtyřech respondentech pro každou z vybraných oblastí Walesu ve věkovém rozpětí 35-39 let pro skupinu z Cardiffu a 29-39 pro skupinu z Aberystwyth. Výsledky byly porovnány s výzkumem Volína a Polláka z roku 2009, který mimo jiné na bázi stejného textu, který byl využit při sběru dat pro výzkum této diplomové práce, poskytl výsledky rytmických hodnot dle ukazatelů %V a ΔC pro britský standard.

Ukázalo se, že velšské angličtiny osmi respondentů mají obdobné hodnoty pro ΔC a %V jako mluvčí britského standardu. Dále se ukazuje, že dosavadní přístupy k rytmu nejspíše nejsou dostatečně citlivými ukazateli rytmických rozdílů nářečí s výjimkou nPVI-v.

Nahrávky obstarané pro tuto práci zároveň slouží jako základ korpusu aberystwythských variant angličtiny.

Klíčová slova: *rytmus, britský standard, velšská angličtina, Cardiff, Aberystwyth*

Table of Contents

Abbreviations

Languages and varieties of English:

Gmc	Germanic
OE	Old English
AE	Aberystwyth English
BrE	British English
CE	Cardiff English
EngE	English English
RP	Received Pronunciation
SE	Singapore English
WE	Welsh English

Technical abbreviations:

BG	breath group
ΔC	standard deviation of consonantal intervals in the utterance
meanC	mean duration of consonantal intervals in the utterance
%V	percentage of vocalic duration over the utterance
PVI	Pairwise Variability Index
nPVI-c	normalised Pairwise Variability Index for consonantal/intervocalic intervals
nPVI-v	normalised Pairwise Variability Index for vocalic intervals
varcoC	variation coefficient for ΔC

List of Tables, Figures, Maps, and Pictures

Chapter 5: Discussion

Appendices

1. Preface

'stælgiest ne wæs wihte þy gleawra þe he þam wordum swealg'
Riddle 45, *The Moth Riddle*.

Since the times of Abercrombie's *Elements of General Phonetics* (1967), the research in the field of rhythm has seen new approaches and new methods towards the ways of capturing a perceptual phenomenon acoustically. Yet, it seems that what the measurement strategies capture is not rhythm as such but rather syllabic complexity. It is true that syllabic complexity is believed to be an indicator of rhythm classes of languages, but there have been debates concerning what the exact relationship is.

The present study focuses on rhythm in a dialectological perspective. More precisely, it deals with rhythm of three varieties of British English: two from the area of Wales and one which is claimed to be non-regional. The areas in Wales that were chosen for our purposes are those of Cardiff and Aberystwyth. The third variety is the British Standard, or Received Pronunciation, also called BBC English. It is very often RP that appears in phonetic research under the label of English.

The first part of the theoretical chapter offers a summary of four approaches to rhythm: physiological, acoustic, perceptual, and phonological. The second part introduces Welsh, Welsh English, and RP, with a special regard to rhythm. The last part of the chapter presents a basic overview of the most important approaches towards how to measure rhythm acoustically that have been proposed in the last two decades.

The following chapters provide the results of the research and comment on them. The results are compared for each of the measures to see which strategy could be the most sensitive for dialectological differences in rhythm.

According to variationist linguistics, a high amount of data is crucial (see e.g. Schiffrin 2000, especially chapter 8). The present research comprises analyses of only eight speakers for Welsh English. It follows that the conclusions should be seen mainly as a probe into an area which has

not been covered extensively in research, and the suggestions for further research thus present one of the key outputs of the whole study.

2. Theoretical Background

2.1. Rhythm in General

Various studies of rhythm define the term in various ways, depending on the field and the approach the scientist in question opts for. So, rhythm is dealt with in linguistics, poetics, music, dance, biology, psychology, philosophy, etc.[1] Within the field of linguistics, four basic approaches can be encountered:

1. physiological
2. acoustic
3. perceptual
4. phonological

The approaches can differ both in terms of the definition of rhythm and in terms of the ways and criteria of analysing it. However, it ought to be mentioned directly that the four stances may seem difficult to separate because the ways in which rhythm could possibly be represented in linguistic material itself are always to a variable extent related to physiology, acoustics, perception, and phonology, as will be shown further below. So, the four approaches rather present four aspects of a single phenomenon and thus differ in which of the aspects is emphasised most over the others.

The study of rhythm has sometimes been equalled to the study of stress (Adams 1979: 21) as rhythm can be described as the alternation of stressed and unstressed syllables, or, to be more precise, of more and less prominent syllables. A considerable amount of attention will therefore be paid to stress in the descriptions of the four approaches, and more information will be mentioned about the relation of the two in the following sections. The relation of the syllable and rhythm is also important and will have to be dealt with to a certain extent as well.

[1] For further references see e.g. Adams 1979 (especially p 9 and chapter 1), Cureton 1994, Duběda 2005 (chapter 12), and Volín 2010.

2.1.1. Physiological Approach

Abercrombie and his definition from 1967 could be taken as a representation of the physiological approach:

> *Rhythm* [...] *arises out of the periodic recurrence of some sort of movement, producing an expectation that the regularity of succession will continue. The movements concerned in the rhythm of speech are those of the syllable- and stress-producing processes, which together make up the pulmonic air-stream mechanism* [...]. *Speech rhythm is essentially a muscular rhythm, and the muscles concerned are the breathing muscles.* Abercrombie 1967: 96[2]

The definition actually touches upon two aspects of rhythm: first, the expectation referred to is clearly an issue of perception; second, what follows is purely an issue of physiology, at least as formulated above. In its absolute form, then, the physiological approach emphasises the physiological processes based on the speaker in particular, not on the listener, and thus on speech production. As the next sections of this chapter show, this view is rather outdated.

The syllable- and stress-producing processes mentioned in Abercrombie's definition were subject to experiments in the years to follow; those like Draper, Fonágy, Ladefoged, and Whitteridge investigated the physiological aspects of stress with technology not available to Abercrombie in 1967.[3] They focused on the activity of respiratory muscles, subglottal pressure, and the volume of air in the lungs, and found that 'linguistic stress is a measurable bodily activity' and that it 'is a gesture of respiratory muscles [which] can be specified in terms of the amount of work done on the air in the lungs' (Ladefoged 1967: preface). Similarly, Fonágy found that '[s]tress and stress perception is closely related to increased activity of the phonatory apparatus, especially of the inner intercostal muscles' (Fonágy 1966: 236, in Adams 1979: 75). It was also proved that there is 'a relationship between subglottal pressure and *stressed* syllables' (Adams 1979: 68 quoting Ladefoged 1967: 46), every stress being 'accompanied by an extra increase of subglottal pressure' (Ladefoged 1967: 46).

Nevertheless, what was ascertained for stress was not the case for the syllable:

> *[N]o correlation between subglottal pressure and syllables [was found]. It is clear (...) that Stetson (1951) is wrong in claiming that there is a relation between respiratory*

[2] See also Pike: 1946 and Abercrombie 1965 (in Grabe and Low 2002: 517).
[3] For more details concerning the techniques and technology used, see e.g. Ladefoged 1967, especially pp 3-11.

> *activity and the syllable in addition to the relation between subglottal pressure and stressed syllables [...]*. Ladefoged 1967: 46-47

Hence, they conclude that 'there is certainly insufficient basis for a chest pulse theory of the syllable in normal speech' (Ladegofed 1967: 47).

Concerning rhythm, the implications of this finding are not entirely categoric in that the phenomenon is related both to the syllable and to stress, and the fact that the syllable cannot be measured physiologically, at least according to the findings presented above, does not mean that stress cannot, either. This means that as far as rhythm is connected with stress, it will always be a physiological phenomenon to at least some extent. However, other aspects of rhythm make the picture a little more complex.

2.1.2. Acoustic Approach

The second, acoustic approach emphasises the four physical quantities of sounds:

1. time/duration
2. spectrum
3. frequency
4. intensity

and thus again the speaker, because those quantities represent the production, not the perception, of speech. The characteristics have been used separately as well to define what stress and rhythm are.

2.1.2.1.

Jassem defines rhythm as 'purely specific arrangements of the duration of syllables'. (Jassem in Crystal 1969: 115, underlining mine). However, whilst duration is definitely an important acoustic quantity of rhythm, Duběda states that

> *[b]ecause the duration of segments can have a distinctive function on the segmental level and because it also tends to be used in various other ways in the system (final lengthening, autosemantic/synsemantic characterisation of the theme/rheme), it is necessary to characterise the temporal component always with respect to these circumstances.* Duběda 2005: 154[4]

[4] 'Protože trvání hlásek může mít segmentálně distinktivní funkci, a navíc bývá v prozodickém system využito i jinak (finální dloužení, charakterizace autosémantičnosti/synsémantičnosti, tématu/rématu), je třeba temporální složku přízvuku vždy charakterizovat s ohledem na tyto okolnosti.' [translation mine]

Phonological issues may thus complicate the researcher's reliance on duration.

2.1.2.2.

An interesting question to ask is if and how rhythm can influence or can be influenced by the spectrum of segments, especially regarding vocalic reduction. Several options suggest themselves:

a. consistent presence of reduction of vowels in unstressed syllables (e.g., English, Russian - Duběda 2005: 35; Arabic - Roach 2006: 135)
b. consistent absence of reduction of vowels in unstressed syllables (e.g., Czech - Duběda 2005)
c. inconsistent presence/absence of reduction of vowels in unstressed syllables (e.g., non-Standard varieties of Czech - Duběda 2005)

Duběda discusses languages of various rhythmic types in relation with the vocalic reduction, and observes that languages of the same rhythmic type do not necessarily follow the same rule concerning the absence or the presence of vocalic reduction, although the correlation is fairly common:

> *Correlation of metrical structure and distribution of segments functions most often on the basis of reduction, i.e. weaker articulatory characterisation of unstressed syllables [...]. The degree and the frequency of the reductional processes is quantifiable and thus can be used as a typological criterion.*[5] Duběda 2005: 154

It could be argued whether reduction is a question of spectrum or duration. We believe it is both. It might also depend on whether phonetic or phonological criteria are applied.[6]

2.1.2.3.

The third quantity, frequency, can differ in stressed and unstressed syllables depending on the language in question (Fry 1964: 138, in Adams 1979: 80; see also further below in this chapter). This should not be confused with sentential intonation, which is not phonetically inherent to stressed and unstressed syllables as such.

[5] 'Korelace metrické struktury a distribuce segmentů nejčastěji funguje ve smyslu redukce, tedy slabší artikulační charakterizace nepřízvučných slabik […]. Stupeň a četnost redukčních procesů lze kvantifikovat, a tedy i využít jako typologické kritérium.' [translation mine]

[6] For more information about reduced vowels in the research of rhythm, see e.g. Low, Grabe, and Nolan 2000, pp 385-399, and also Ferragne and Pellegrino 2004.

2.1.2.4.

Intensity has been seen as the decisive characteristics of stress. Duběda claims that '[i]ntensity seems to be correlated with stress especially in case of reduction languages'[7] (Duběda 2005: 156). Interestingly, Lei He has suggested that it is intensity metrics, and not duration metrics, that distinguish English from Mandarin rhythmically in a more reliable way (He 2012).

However, from a cross-linguistic point of view, rhythm does not seem to be generally correlated with intensity and, in the same way, it would not appear to be universally correlated with duration, spectrum, or frequency, either. This leaves us with an important question: what, then, is rhythm acoustically?

The uncertainty and difficulty connected with stress and rhythm lie in the fact that both are perceptual phenomena, which means that the acoustic characteristics do not seem to suffice to define them. Even for a single language such as English, Ladefoged ascertains that

> *[...] stress is best described in physiological rather than acoustic terms. Because of the interaction of vowel quality and intensity and the trading relationships between intensity, frequency and duration (Lieberman, 1960), there is no single, simple acoustic event that always occurs in all stressed syllables in spoken English.* Ladefoged 1967: 46

To provide a brief example,

> *[a]lternating sequences of syllables [...] or of tone and noise bursts [...], when presented with equal temporal intervals between successive acoustical onset, are not perceived as having a subjectively uniform rhythm. Generally, it is assumed that this effect is due to the fact that the psychological onset of an acoustic event [...] does not correspond to its acoustical onset.* Pompino-Marschall 1991: 351

So, the acoustic quantities have been analysed and re-analysed to throw more light on what the acoustic correlates of the perceived rhythm are (This is one of the aims of the present study as well.). Since such analyses cannot be separated from the perceptual approach, however, attention will be paid to those in the next section.

[7] 'Intenzita se zdá být korelována s přízvukem zvláště u redukčních jazyků [...].' [translation mine]

2.1.3. Perceptual Approach

Perception and Acoustics

The third, perceptual approach emphasises the auditory and the neural, suggesting that neither physiology nor acoustics are the only aspects of rhythm and that the speaker is thus not the only participant of communication:

> *What seems to be the case is that if the acoustic information comes in predictable intervals that correspond to the theta brain frequencies (about 6 to 12 Hz), the perceptual mechanisms can decode the speech signal better than under other conditions. [...] Countless measurements showed that natural speech does not provide any series of identical time intervals yet its configurations sound rhythmical to the listeners. [...] The key problem is that rhythm is not a property of the acoustic signal but a perceptual phenomenon. [...] It is the listener who decides what is rhythmical and what is not. The acoustic signal alone cannot provide the answer.* Volín 2010: 297-298 and 303

For the psychological(/neural) in rhythm, see Fry 1958 in Crystal 1969: 116, who, however, discusses stress, not rhythm per se; or Cureton 1994 and Adams 1979.

The relation of the acoustic and the perceptual has been a focus of many studies because

> *[...] a sound stimulus may be varied along several physical dimensions, and such variations [in those dimensions], provided they fall within certain ranges, will give rise to changes in the perceptual dimensions.* Fry 1958: 129, in Adams 1979: 80

The following scheme presents the acoustic/physical dimensions and their perceptual correlates respectively:

1.	spectrum/formant structure	~	quality of segments
2.	frequency	~	pitch
3.	intensity	~	loudness
4.	time/duration	~	length/quantity of segments

In his research, Fry found that 1. spectrum / formant structure was the least important out of the four possible cues in the English material he analysed (Fry 1964: 308 and 311, in Adams 1979: 82). Next, Fry's research showed that, considering 2. frequency in English,

> *[...] the magnitude of the frequency change seems to be relatively unimportant while the fact that a frequency change has taken place is all-important. [... A] higher syllable is more likely to be perceived as stressed; the experiments with more complex patterns of fundamental frequency change suggest that intonation is an over-riding factor in determining the perception of stress and in this sense the fundamental frequency may outweigh the duration one.* Fry 1964: 138, in Adams 1979: 80

About 3. intensity, he states that, like 4. duration, it is 'a cue for judgments of stress[, but] duration ratio is a more effective one than intensity ratio' (Fry 1964: 138, in Adams 1979: 80). Crystal writes that 'intensity is not completely irrelevant, nor can stress judgements be completely explained away by reference to frequency, etc., as is evidenced by our ability to perceive stress distinctions in whispered speech [...]' (Crystal 1969: 116).

On the basis of what has been said, the following hierarchy can be outlined for the importance of the physical correlates of stress as perceived in (most likely Standard) English, 1. being the most important, 4. the least:

1. duration/time
2. intensity
3. frequency
4. spectrum

This, however, does not apply to all languages. Native speakers of Polish and Serbo-Croatian, who were subject to Lehiste's and Ivić's analyses, differed from native speakers of English in which of the cues are more important, in whether they are more important in various combinations, and how exactly (Lehiste and Ivić 1963; Lehiste 1970). Furthermore, 'for a specific judgment [the listener] may be more dependent upon one cue than upon another' (Adams 1979: 80). The hierarchy given above, therefore, has to be assessed tentatively even for English.

Stress-Timed and Syllable-Timed Languages

A crucial issue connected with 4. duration/time is the debate over syllable- vs stress-timed languages as well as the debate over the existence of isochrony as such (Crystal 1969: 162).

It is believed that in a stress-timed language, such as English, 'the stressed syllables fall at regular intervals, whether they are separated by unstressed syllables or not' (Crystal 1996: 8); whereas in a syllable-timed language, such as French, 'all syllables occur at regular time intervals, whether they are stressed or not' (Crystal 1996: 8). So, languages can be said to be stress-timed or syllable-timed. In stress-timed languages, syllables should be of different duration so that the interval between two stressed syllables, the foot, is equal. In syllable-timed languages, syllables should be of equal duration.

There is a third generally distinguished type: a mora-timed language.

> *Mora [is now used especially] as a unit of phonological LENGTH. The analysis of SEGMENTS into morae is usually applied only to the syllable NUCLEUS and CODA (the RHYME), and not to the ONSET. See Hogg and McCully 1987: Ch. 2.*
> Crystal 1992: 223

Mora-timed languages will not be considered in the present paper as English is believed to be stress-timed and Welsh rather syllable-timed.

As implied above, the classification of languages into stress- and syllable-timed has proved to be simplistic. Roach states that

> *[...] there is no language which is totally syllable-timed or totally stress-timed – all languages display both sorts of timing ...* [and] *different types of timing will be exhibited by the same speaker on different occasions and in different contexts.*
> Roach 1982: 78, in Crystal 1994: 175

Similar observations were made much earlier by those like O'Connor, who 'showed that even a limerick in which rhythm was as strict as possible, physical isochrony was not present' (O'Connor 1965: 11, in Adams 1979: 50). Based on similar conclusions, the terms 'stress-based' and 'syllable-based' languages have been introduced (Dauer 1983, 1987 in Low and Grabe 2002: 518; Crystal 1996: 9).

Nevertheless, Crystal comments upon Roach's statement rather sceptically: 'This is fair comment, but I do do not think the conclusion has been followed up by appropriate empirical observation. Just how much syllable-timing is there in English, for example?' (Crystal 1994:

175); and he goes on listing the contexts in which (English) English rhythm is syllable-timed (Crystal 1994: 175-6).[8] He makes other important observations:

> *The alternative suggestion, that a subjective isochrony exists, i.e. we 'read in' rhythmic regularity to perceived utterance, is more likely, in view of the ear's ability to hear differences where none objectively exist and vice versa.* Crystal 1969: 162

This goes along the line of what Allen claims,

> *[observing] that many researchers have been disappointed at not finding [the tendency toward equality of interstress intervals in English] in their data because they had not established in advance a criterion for deciding when there was a 'tendency' and when there was not – they could see only strict equality or none. Thus, he contends, failure to prove that English is stress-timed 'may be blamed as much on inadequate conceptions of what stress-timing can be and improper tests for its existence as on its non-existence in English.'* Allen 1970: 82, in Adams 1979: 54; and Adams 1979: 54

Apparently, one deals with a gradient, not with strictly categoric entities. We understand the terms as two rhythm types, which are very rarely realised to the full extent acoustically, but which may be understood as regular and as realised to the full, or at least fuller, extent perceptually. It could be said that 'stress-timed' and 'syllable-timed' refer to *langue* and 'stress-based' and 'syllable-based' to *parole*.[9]

This, however, does not seem to be the only possibility. Nolan and Asu write about the idea of 'coexisting rhythms' and

> *[...] claim that syllable-timing and stress-timing (or foot-timing) can be independent dimensions of temporal organization on languages rather than opposite ends of a continuum. Syllable-timing operates on the syllable level and foot-timing operates on a larger timescale, i.e. on a foot level. This idea of coexisting rhythms agrees with the idea of multiple rhythmic systems which are associated with multiple timescales and coordinate prosodic events on multiple timescales.* Ordin et al. 2011: 1131

The mention of *langue* is closely connected to the phonological approach to rhythm.

[8] The two labels are also well established in pedagogy as they seem to be didactically convenient.

[9] '[T]he different rhythm types may not only be a perceptual illusion (Lehiste 1977), but they are – as perceptually defined categories – surely further influenced by the limitations of durational and rhythmic perception in general.' Pompino-Marschall 1991: 359

2.1.4. Phonological Approach

(Non-)Phonologicality of Rhythm

To better understand the phonological approach to rhythm, one should start with a general definition of phonology.

According to Crystal, '[t]he sounds are organised into a system of CONTRASTS, which are analysed in terms of PHONEMES, DISTINCTIVE FEATURES, or other such "phonological UNITS", according to the theory used.' (Crystal 1992: 261) Crystal's wording is interesting in two respects. First, it emphasizes phonemes, which are segmental; and, second, it highlights the fact that phonological theories may differ in tackling various issues differently.

It can be easily imagined how two phonemes can be contrastive (*bed* vs *bad*, *lack* vs *pack*); however, regarding rhythm, such clear distinctive contrasts may as well never be found. Does this mean that rhythm cannot be functional/phonological?

The issue of (non-)phonologicality of rhythm is clearly to a considerable extent conditioned by phoneme being the centre of phonology, and the definitions suggesting that contrasts are what makes a linguistic unit phonological would probably claim that rhythm should be described as a non-phonological phenomenon. It is, therefore, not surprising that opinions not in favour to phonologicality of rhythm can be encountered (e.g., Martinet in Crystal 1969: 179-180).

Nevertheless, Duběda argues that concerning prosody it is very difficult to delimit the exact boundary of what is and what is not phonological (Duběda 2005: 123), and Volín states that '[t]he problem might also partly rest in unsatisfactory definitions of the phonological endeavour [and t]he apparent non-phonologicality of rhythm will also deserve reconsideration' (Volín 2010: 290 and 303). Shockey provides an interesting overview of various understandings of phonology (Shockey 2003: 3-13), which are briefly listed in the paragraphs below.

The first standpoint mentioned by Shockey is the one described above. Units are seen as phonological if contrastive in the sense that different forms present different lexical meanings (*bed* vs *bad*).

The second viewpoint can be illustrated on the notion of isochrony, which may be understood as ‘an underlying constraint, and the surface realization of isochronous units [as] perturbed by phonetic, phonological and grammatical characteristics of the language’ (Low and Grabe 2002: 518). This appears to be simply a different wording of what has been mentioned above in relation to *langue* and *parole* and stress-/syllable-timed and stress-/syllable-based rhythmic types. Once phonology is equaled to *langue*, and thus the system, the perceptual contructs of rhythmic types are necessarily phonological. Although in Shockey’s classification this would most likely pertain to de Saussure, we believe that the first standpoint, as well as the second one, could be associated with him.

The third approach partially overlaps with the second one, and it may be illustrated by Universal and Generative Grammars. To give an example, rhythm could be seen as at least partially phonological because it is realised, among other things, by stress; and differences in stress can be distinctive and predictable, which means that stress placement rules can be formed. In languages such as English (and especially in English English, further referred to as EngE), vowel reduction is associated with stress placement rules and thus must be seen as associated with rhythm as well, and it does not matter whether it is rhythm that influences the quality and the quantity of segments or whether it is the other way round. The following English examples serve as an illustration of reduction of vowels in unstressed syllables:

[1] *democracy* /dəˈmɒkɹəsɪ/

[2] *democrat* /ˈdeməˌkɹæt/

[3] *obligation* /ˌɒblɪˈgeɪʃn/

[4] *oblige* /əˈblaɪʤ/

Within this viewpoint, phonological rules would be connected with morphological rules in case of *demoncracy*- and *obligation*-families (and with many others).

Shockey suggests yet another standpoint:

> *Phonology is the systematic study of the pronunciation/perception targets and processes used by native speakers of a language in everyday life. It presupposes articulatory control of not only the contrasts used meaningfully in a language, but also of other dynamic features which lead to variation in speech sounds, such as tension of the vocal tract walls (cf. Keating, 1988: 286). It therefore includes all articulatory choices which make a native speaker sound native, including sociolinguistic variables*

> *such as register and style. It does not include simple coarticulation but can place limits on degree of coarticulation (Farnetani and Recasens, 1995; Manuel, 1990; Whalen, 1990). Note that here again, the boundary between phonetics and phonology is hard to define, though it is clear that version 4 phonology includes a great deal of what is normally thought of as phonetics.* Shockey 2003: 10

Yet another viewpoint would be sociolinguistic. Differences in rhythm cross-dialectologically certainly have a social function as well, simply because language cannot be devoid of social aspects. This is, of course, included in the approach suggested by Shockey.

Synchrony and Diachrony

Phonological stance on rhythm has been employed both in synchrony (Daneš 1957[10]; Albrow 1968; Roach 2006: 134-138) and in diachrony (Lass 1987: 108-118; Lass 1994: 83-102; Dresher and Lahiri 1991). Obviously, the physiological, acoustic, and perceptual cannot be applied to diachronic analyses, at least not directly, although some have attempted to do so. As an example from historical research in general, we could mention Meyer, who tried to explain Grimm's Law by the influence of the air in the mountains on the pronunciation of the speakers (Meyer 1901 in McMahon 1999: 18). Others suggested physiology ('physiological peculiarities of the Teutons'; see more details in Rastorguyeva 1983: 41-2). Various works, such as that by B. E. Dresher and A. Lahiri from 1991 on foot and rhythm, have also appeared.

In the context of the history of English, Lass describes a stress rule as 'a device [that] constructs feet according to some predefined recipe' (Lass 1994: 85). This principle, as we shall see, might be rhythm. Lass goes on to mention

> *[...] a group of changes* [in the history of Germanic and OE] *that seem to depend not merely on a vowel being in a weak syllable, but on the total weight of the foot. The fates of* [Gmc] *short high */i, u/ in weak positions are largerly determined by the weight of the preceding strong syllable.* Lass 1994: 98

Syllabic structure and its weight have played various roles in the history of English connected especially with vocalic lengthening. No studies on the relation of syllabic structure and weight and rhythm are known to us, which is not surprising because if one attempted an analysis of

[10] It should be noted here that Daneš focuses primarily on the relation of intonation and the FSP (communication dynamism; information structure), not on that of rhythm and the FSP.

how rhythm developed in the history of English, or indeed what it may have been like, one would have to rely on indirect evidence such as syncope and vocalic lengthening and shortening, the reliability of which is necessarily undermined by processes of morphological analogy (among other things).

Describing the changes in the history of English mentioned above, Lass operates with the notion of foot and suggests that '[w]e are not dealing here with a (strict) "sound-law" of the familiar kind, like Grimm's Law; rather something more like a very strong tendency to maximize certain apparently "preferred" foot-configurations, and get rid of others.' (Lass 1994: 102) Those preferred foot-configurations, then, might be equalled to rhythm. How they come into existence, however, is another issue to ponder upon.

In this context, one is tempted to ask if it is the syllabic structure, phonotactics, and vocalic and consonantal systems of a particular language that influence and indeed make up a rhythmic type, or if it is rhythm that influences and to a certain extent makes up the structure of syllables and other segments of a language.

The answer might as well lie somewhere in between the two options.

The Foot and the Syllable

Two terms connected with rhythm have been mentioned above: the foot and the syllable. Cox et al. give the following explanation: 'Suprasegmental constituent structure is considered hierarchical with the phonological phrase (Φ) dominating the phonological word (ω) which in turn dominates the foot (F), the superior constituent to the syllable (σ).' Cox et al. 2009: <http://clas.mq.edu.au/phonetics/phonology/syllable/syll_introduction.html> The foot is a rhythmical unit. It is formed by a syllable which carries the primary stress and, if the foot is not monosyllabic, by a number of syllables not carrying the primary stress.

It is important to mention that two types of stress occur in linguistics: Lass, Albrow, and Daneš[11] distinguish word-stress and sentential stress. This is often represented with foot-configuration schemes, such as the one below:

[11] Daneš focuses primarily on intonation and marginally on rhythm as well.

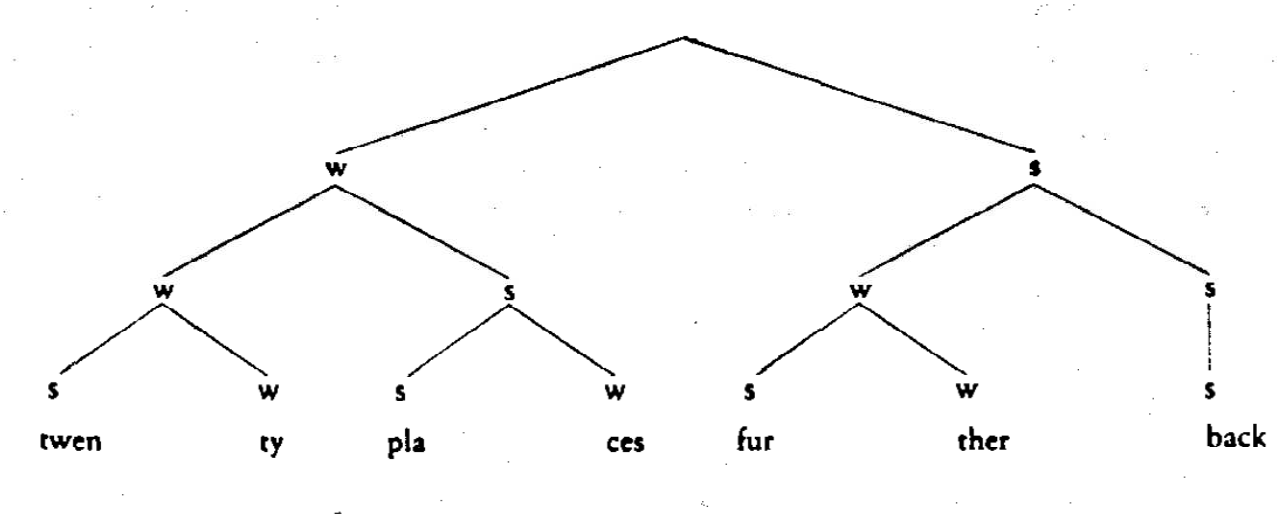

Figure 2.1. Foot-Configuration Scheme for weak and strong syllables in a noun phrase. Taken from Roach 1991: 122.

The first level (s-w, s-w, s-w, s) captures lexical stress. The assignment of s and w in the above layers can be changed once the information structure is to be realised in a marked way. This can be illustrated on the example below:

John (T) *walked to a park* (R).
'*John* (R) *walked to a park* (T). (= It was John who went to a park.)
John (T) '*walked to a park* (T). (= He did not ride on a horse, he went on foot)

It is not only the lexical distinctions carried by stress, but also the rheme-theme distinctions that can be seen as phonological as long as one is willing to put lexical differences on equal terms with information structure differences as regards distinctiveness.

Concerning the syllable, it could be argued what the relationship of the syllabic structure and weight to rhythm is. Low and Grabe write that

> *[s]yllable structure, the presence or absence of vowel reduction, and word-stress are especially relevant to rhythmic differences. In stress-timed languages, syllable structures are more varied than in syllable-timed languages. In syllable-timed languages, vowel reduction is rarely found. […] Dasher and Bolinger suggested that the rhythm of a language is the result of specific phonological phenomena such as variety of syllable types, the presence or absence of phonological vowel length distinctions, and vowel reduction. [They] argued that rhythm type is not a*

phonological primitive but results from the phonological structure of a given language.
Low and Grabe 2002: 518

This is supported e.g. by observations made by Duběda, who states that the characteristics of syllabic weight differ across languages (Duběda 2005: 133): what can be considered a heavy syllable in one language may as well be considered a light syllable in another. Whether syllabic weight can be correlated with stress, and thus rhythm, and how exactly is thus a question which shall not be answered here.

2.1.5. Summary

In conclusion, it can be stated that the above-mentioned approaches are all based on one single important feature - prominence of syllables, and on alternation of more and less prominent syllables. The prominence itself is complex in that it can be related to the four acoustic ~ perceptual aspects, which are repeated here:

1.	duration/time	~	quantity/length
2.	spectrum/formant structure	~	quality
3.	frequency	~	pitch
4.	intensity	~	loudness

Although each approach emphasises different features of rhythm as the crucial ones, we believe all of them are important and cannot be entirely separated from one another.

2.2. Received Pronunciation

Received Pronunciation (RP, Received Standard, or BBC English) is 'what anyone living in the [UK] hears constantly from radio and television announcers and news-readers and from many other public figures' (Wells 1982: 279); in other words, it is a variety of English English which started emerging as a distinct sociolect especially at the end of the 19th century.

Jones states that 'between 1750 and 1800 (and even more so post-1800) there is a sea-change [in Britain] in the way linguistic usage is perceived to relate to criteria such as social status and place of geographic origin' because of 'the rise of a monied, non-aristocratic middle class' (Jones 2006: 117), which certainly has to do with the Industrial Revolution (1760-1851)[12] and which goes also hand in hand with the fact that it was at the latter half of the century when other aspects of the language had been codified.[13] Ellis is the first to use 'received pronunciation' as a term, which is supported by Fennell (and others), who claims that the term 'entered into British common vocabulary' only at the end of the 19th century 'to refer to the educated accent of London and the Home Counties' (Fennell 2001: 185). Daniel Jones called the variety Public School English in 1917, but described the same variety of the language as Received Pronunciation in 1926.[14] The social and linguistic status of RP today, at the beginning of the 21st century, has to face various issues connected with the social changes which happened in the UK, but, as the description given by Wells proves, (near-)RP is still seen as prestigious in many ways.

For more details about RP in Present-Day English (PDE), see e.g. Wells 1982, Giles 1991, Gimson 1984, and Ramsaran 1991. Concerning the emergence of RP as a distinct sociolect, see e.g. Beal 2004, Crowley 2003, Jones 2006, and Mugglestone 2003.

Works touching upon English rhythm typically discuss that of RP, undoubtedly because this variety is often taught (or is at least supposed to be taught) to the learners of the language. So, 'English rhythm' very often refers to the rhythm of either RP or English English. As the latter includes a range of fairly different varieties, it can be seen rather as an umbrella term. What has been described as the rhythm of English in section 2.1.3. Perceptual approach is thus a

[12] '[M]assive social and economic changes since the Industrial Revolution [... 1760-1851] had the effect of revalorising regional dialects as class dialects, as the population shifted from the countryside to the cities.' (Milroy 1991: 184).
[13] 'By the end of the eighteenth century, codification of the other levels of structure led to the production of the pronouncing dictionary' (Leith 1987: 54).
[14] See e.g. Ihalainen 1994.

description of rhythm as attested in RP. This variety of English can be labelled as a stress-timed/based type of English, where the placement of stress often depends on the etymology of both roots and suffixes in individual lexical items. As mentioned above, the vowels in unstressed syllables are reduced.

Beal traces the reduction of vowels in English back to the Late Modern English period (1700-1945):

> *In words such as* traveller, stronger, agreed, considered, *Jones uses /ə/ to transcribe all the vowels in unstressed syllables, but Walker has his "short* u*", transcribed here as /ʌ/ for the* -er *in* traveller, stronger *and the "full" vowel corresponding to the spelling in the first syllables of* considered, agreed. *Lass points out that, whilst "received wisdom ... is that from the end of the Old English period vowels in weak position in the foot tended to reduce to schwa" (1999: 133), clear evidence is hard to find until much later. The only evidence from Middle English is a tendency for vowels in unstressed syllables to be represented in apparently random ways or for one vowel grapheme to take the place of others. However, as Lass points out, there is "no mention of special qualities in weak syllables" in the works of sixteenth- and even seventeenth-century orthoepists. from Wallis (1653) onwards, there is recognition of an "obscure" vowel, but this is the STRUT vowel, and is identified only in stressed syllables. [...] However, the pronunciation of unstressed vowels was one of the most contentious issues discussed in eighteenth-century pronouncing dictionaries and other works [...].*
> Beal 2004: 149-150

The distribution of phonologically long vowels in RP and near-RP is limited to stressed syllables. Phonetically speaking, vocalic length is a more complex issue, which will not be elaborated here.

2.3. Welsh

Welsh is the most widely spoken Celtic language today. The majority of speakers live in Wales, but a strong minority can also be found in Patagonia. The precise number is difficult to determine because of the endangered state of the language bringing about a rather complex sociolinguistic situation. According to the census from 1991, the total number of Welsh speakers in all countries comes to 537,870 (Lewis 2009:

<http://www.ethnologue.com/show_language.asp?code=cym>). As Coupland claims, 'there is evidence that regional accents of English in Wales can also mark national identity and allegiance [and] it is ultimately impossible to give an adequate account of *either* Welsh *or* English in contemporary Wales in isolation from the other language' (Coupland 1988: 18). Hence, a brief description of some of the features of Welsh is presented here.

2.3.1. Stress in Welsh

The placement of stress is fixed in the language:

> *Native Welsh stress is penultimate and suffixation moves word-stress to the new penult*: cymwynas [kə'muɨnas] *'favour';* cymwynasgar [kəmuɨn'asgar] *'helpful'*, cymwynasgarwch [kəmuɨnas'ga:rux] *'helpfulness'*. Watkins 2002: 302

However, words with a different placement of stress can easily be found. Williams (S. J. Williams 1980 in Ball and Williams 2001: 166) gives altogether seven different sources of irregular stress placement in Welsh, all of which could be grouped into three major classes:

a. borrowing
b. contraction
c. compounding

Considering the amount of work done on Welsh phonetics and phonology, Ball and Williams present quite detailed information. Most importantly, Welsh stress is not the same as that of English. They observe that '[t]he evidence points to a situation where the vowel of the penult is both acoustically and phonologically weak relative to the supposedly unstressed ultima.' (Ball and Williams 2001: 171). This can be of such an extent that the (allegedly) stressed penult syllable can be reduced to a schwa or deleted, while, in case of the unstressed ultima, this does not happen (Ball and Williams 2001: 170). Furthemore, the authors point out that

> *It would seem that neither higher F0 nor longer duration are a reliable cue to stress, at least not in the case of stressed penults in polysyllabic words (stresses monosyllables, on the other hand, seem to show the same pattern as for English. [...] F0 prominence and phonological stress are not as closely correlated in Welsh as they are in English.* Ball and Williams 2001: 169 and 171

Thus, Thomas claims that there are two phonetic stresses in Welsh: 'rhythmic stress on the penultimate syllable, [and] pitch-prominence on the ultimate syllable' (Thomas 1984: 121 in Ball and Williams 2001: 184).

2.3.2. Rhythm in Welsh

The most detailed information available to us can, again, be found in Ball and Williams, who point out that 'there [is] a very strong positive correlation between foot duration and the number of syllables per foot' in Welsh' (Ball and Williams 2001: 175). Very tentatively, on the basis of experiments done by Williams in 1989, they suggest that '[t]his would appear to be a case of a tendency to isochrony' (Ball and Williams 2001: 176).

Grabe and Low analysed Welsh in their research from 2002 and according to two measures, %V and ΔC (see more further below), Welsh is more syllable-based than BrE and less than Singapore English (SE). However, the differences between Welsh and SE seem to be fairly small.

2.3.3. Vocalic Reduction in Welsh

In the previous section on RP, it was mentioned that schwa plays an important role for the stress-based varieties of English that exhibit vocalic reduction, such as RP. The situation in Welsh is remarkably different:

> *As for a less 'schwa-like' realisation of the stressed vowel, the situation is complicated in Welsh by the fact that it is possible for a schwa vowel to bear primary lexical stress (in the case of polysyllabic words). The distribution of schwa in Welsh does not accord with the distribution of stress: a schwa may appear in any syllable except a final syllable, while stress normally falls on a non-final syllable, the penult. This situation, which permits schwa to be stressed, arose due to the Old Welsh accent shift.*
>
> Ball and Williams 2001: 169

Of course, the influence of Welsh on English in Wales is not the only direction to expect. It has been found that '[i]n contemporary borrowings [...] /ə/ does occur in these positions [i.e. those excluded above]: [bəs] "bus", [fən] "fun", [fəs] "fuss", [kondəktə(r)] "conductor".' (Watkins 2002: 303) Furthermore, various dialects of Welsh have various phonological systems and various realisations of the systems. So, the dialects of Pembrokeshire manifest different equivalents of schwa in unstressed positions (Awbery 1984: 79) and, in 'much of south

Cardiganshire and stretching over into north Pembrokeshire, the restrictions on the central vowel are marginally relaxed. Here it may appear in the monosyllabic forms, in contrast to the normal ban on it in this environment.' (Awbery 1984: 78-9)

2.3.4. Welsh spoken in Aberystwyth and Cardiff

One of the administrative parts of Wales (map 1), Ceredigion, can be further divided in two parts, which form a geographical continuum. Aberystwyth is situated in Ceredigion (map 2). The number of the inhabitants of the city is 17,730 together with the surrounding villages such as Comins Coch, Llandabarn Fawr, Waunfawr, or Bow Street (Aberystwyth, Population Statistics <http://www.aberystwyth.org.uk/more/statistics.shtml>).

Map 2.1. Welsh Counties. Administrative parts of Wales.
2nd Dec 2011 <http://www.holidayweb.co.uk/wales/index.htm>.

Map 2.2. Ceredigion.
2nd Dec 2011 < http://www.ceredigioncamra.org.uk/About/tabid/62/Default.aspx>.

As can be found on the website of the city, 'it is reasonable to assume roughly an additional 8,000 students can be added to the population during termtime' (Aberystwyth, Population Statistics <http://www.aberystwyth.org.uk/more/statistics.shtml>). The influx of students can thus be linguistically important in the long run.

The city website also provides information related to the number of Welsh speakers:

Ability	Aberystwyth area	Wales average
Understands spoken Welsh	39%	24%
Speaks Welsh	34%	21%
Reads Welsh	33%	20%
Writes Welsh	29%	18%
Speaks, reads or writes Welsh	37%	23%

Table 2.1. The number of Welsh speakers in Aberystwyth. Taken from Aberystwyth, Population Statistics <http://www.aberystwyth.org.uk/more/statistics.shtml>.

Concerning the variety of Welsh spoken in Aberystwyth, there are opinions such as that the traditional Welsh dialect of Aberystwyth is no longer alive. These views can be found among the population of the city.

As regards Cardiff, according to *Census 2001: Report on the Welsh language*, 83.69% of the population claimed to have no knowledge of the language (*Census* 2001: 7). The remaining 16.31% came to 294,208. No studies on the rhythm of Welsh spoken in Cardiff are known to us.

2.4. Welsh English

Welsh English (WE) is very often used as an umbrella name for English as spoken in Wales. However, similarly to various EngEs, there are differences in the varieties of WE too, and it could be expected that these differences affect rhythm as well.

It has been observed that

> *Welsh accents have one unusual stressing characteristic. This relates to longer words and compounds, and consists in the avoidance, in many instances, of secondary stresses in the word – stresses other than the main word stress – together with resyllabication. Thus Bridgend is pronounced* /brɪdʒ'ɛnd/*: compare to its RP form* /'brɪdʒ'end/*, optionally reducible, depending on rhythmic factors, to* /brɪdʒ'ɛnd/ *or* /'brɪdʒɛnd/. [...] *Certainly rhythm and intonation are among the diagnostic characteristics for recognizing an accent as Welsh.*
> Wells 1982: 391-2

Crystal formulates the idea in a more comprehensive way:

> *Some accents display a noticeable tendency towards syllable-timing – certain varieties of Welsh English, for example. It is actually possible to be momentarily confused between Welsh and Indian speakers* [...] Crystal 1994: 178

English in Wales cannot be investigated thoroughly without a possible influence of Welsh (Wells 1982: 377). Nevertheless, the attitudes towards Welsh are of various character (see e.g. Stephens 1973, which is still very up-to-date), and this is no doubt reflected in the extent of the linguistic influence. Of course, various socio-historical factors (such as EngE speaking parents, political affiliation, education, etc.) play an important role.

2.4.1. Rhythm in the English of Aberystwyth

As there seems to be no specific study of the Welsh spoken in Aberystwyth, there seems to be none of the English of the place, either.

The closest information available can be found in the study of rural dialects of North Wales, where Penhallurick mentions two places close to Aberystwyth: Furnace (Dyfed 1) and Rhydyfelin (Dyfed 2). The features of the varieties as attested in Furnace and Rhydyfelin appear to be influenced by Welsh to a considerable extent (Penhallurick 1991). The data cannot, however, be used here for two reasons: a. these are rural places; b. there is no information on suprasegmental features.

2.4.2. Rhythm in Cardiff English

Cardiff English (CE) has been mapped especially by Mees and Collins (e.g., 1977, 1983, 1987, 1990, 1999) and Coupland (e.g., 1980, 1988). As Coupland writes, '[CE] is not at all clearly delimited in its own right and subsumes much inter- and intra-personal variation'; yet, the historical context makes the variety distinct from other Welsh varieties of English: 'Welsh substratal influence on [CE] is in fact minimal' (Coupland 1988: 46 and 50). For more details, see Coupland 1988, especially chapter 2.

Concerning rhythm, Coupland points out that '[a]s Wells says (1982, Vol. 1: 91), our ignorance about the rhythmical characteristics of local accents is still very great' (Coupland 1988: 31). He makes only tentative observations himself, mentioning that 'some Cardiff speakers do seem to move towards a more even stressing of syllables within connected speech, giving a staccato effect' (Coupland 1988: 31), which is demonstrated on the evidence of an old woman who shows non-standard features even in her segments.

Eleven years later, Mees and Collins reported that

> *[a]lthough CE does not regularly exhibit Welsh-type consonant lengthening (Connolly 1981: 59), there is frequently noticeable extra weight and pitch movement giving undue prominence to final unstressed syllables [...]. It is perhaps in certain of these rhythmic features that CE can be shown to have most in common with GSWE accents.*
> Mees and Collins 1999: 194

According to the segmental description of CE given by the authors, schwa should appear in unstressed syllables as well as in the STRUT words.

2.5. Rhythm Measurement Methods

As noted in the introduction, since the times of Abercrombie's *Elements of General Phonetics* (1967), the methods and approaches towards the research of rhythmic types have seen remarkable changes, all attempting to capture rhythm in the acoustic signal. As has been mentioned above, rhythm seems to be a perceptual phenomenon in the first place. This fact would appear to make the search for how to measure rhythm acoustically at all a precondition for the search in rhythm in general. There has been a considerable amount of arguments among the specialists in the field, and this section presents a brief summary of the most common measures used in the current research.

The most serious arguments turn around whether the measures really measure rhythmicity; i.e., whether they measure rhythm directly, or whether they measure only syllable complexity of languages, which is closely related to rhythm and seems to serve as an indirect indicator of rhythmic types.

2.5.1. Ramus et al. 1999: %V, ΔV, and ΔC

Ramus et al. propose three measures to capture rhythm acoustically. They also argue that vowels are the most important in the perception of rhythm, basing the argument on language acquisition research.

A corpus of eight languages was used for the analyses (English, Dutch, Polish, French, Spanish, Italian, Catalan, Japanese), which were represented by four speakers for each language and five sentences for each speaker.

To measure rhythm, three metrics were calculated: %V (the proportion of vocalic intervals within the sentence), ΔV (the standard deviation of the duration of vocalic intervals within each sentence), and ΔC (the standard deviation of the duration of consonantal intervals within each sentence). Since %V and ΔC are indicators of syllabic structure, there is a negative correlation between the two metrics. The lower the %V, the more stress-timed a language should be; and the lower the ΔC, the more syllable-timed a language should be. Regarding ΔV, the higher the

values, the more stress-timed a language should be. This study is then confronted with behavioral experiments, which seem to suggest that ΔV might be useful for distinguishing rhythm types especially if combined with either ΔC or %V.

It should be noted that the data used for the research were regulated as for the speech rate, but the metrics themselves were not.

2.5.2. Low, Nolan, and Grabe 2001 and 2002: PVI

In 1995, Low and Grabe presented a new method of rhythm measurement: PVI, or Pairwise Variability Index. This index calculates the difference in duration of successive vocalic/consonantal intervals and divides it by the mean duration of the pair. The formula is as follows:

$$rPVI = \left[\sum_{k-1}^{m-1} |d_k - d_{k+1}| / (m-1)\right]$$

This presents the raw PVI, rPVI, which is not normalised for speech rate. PVI which normalises speech rate, nPVI, is calculated according to this formula:

$$nPVI = 100 \times \left[\sum_{k-1}^{m-1} \left|\frac{d_k - d_{k+1}}{(d_k + d_{k+1})/2}\right| / (m-1)\right]$$

The research of the authors from 2001 compared ten sentences read by ten British and ten Singapore English (SE) speakers. The sentences comprised two sets: one with full vowels, one with many reduced vowels (as in Standard British English). Vowel duration and vowel quality are seen as the most important for rhythm in English – rather than syllable duration, which had been proved by previous research. The results prove that SE is more syllable-timed than BrE.

The authors proceed to compare their results with other rhythmic measurements, with %V, ΔV, and ΔC (which they call ΔIV = intervocalic). They find that %V for SE is very similar to BrE, though slightly lower, which indicates less stress-timing. ΔV corresponds to the results obtained by PVI most and exhibits a greater difference between SE and BrE. ΔC is much higher for SE than for BrE, which should not be the case as SE is perceptually as well as

according to PVI more syllable-timed than BrE. The authors suggest that the clustering of the two varieties of English together is not surprising as they are still varieties of the same language which should differ especially by the vocalic reduction. Thus, the difference for ΔC is, as the authors write, too considerable, SE having 89.4 (50.6) and BrE 62 (17.3). This makes Nolan, Low and Grabe doubt the reliability of ΔC.

PVI-c, or PVI-IV, was measured for the data as well, and the values were almost identical for the two varieties, SE showing a slightly lower value.

The validity of these results was proved again in several studies, e.g. in that by Low and Grabe from 2002, in which they presented the Rhythm Class Hypothesis. The hypothesis claims that languages, when plotted on a two dimensional figure, should cluster according to their PVI values. So, stress-based languages should exhibit higher PVI-v and PVI-c and cluster in the top right corner, whereas the opposite should be the case for syllable-based languages. The following scheme shows the results:

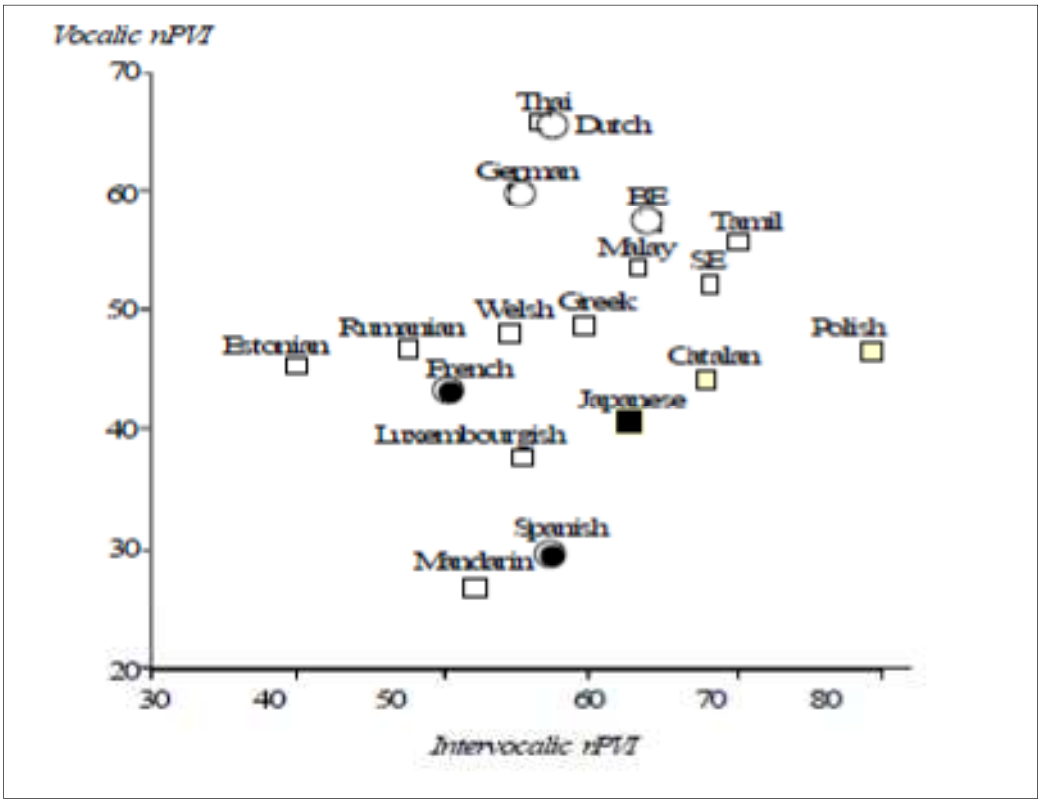

Figure 2.2. PVI values as measured by Low and Grabe 2002 for the languages analysed. The plot combines the consonantal/intervocalic nPVI and the vocalic rPVI.

Rhythmically unclassified languages, one of them being Welsh, 'do not fit into any of the three classes. Instead, their values overlap with the margin of stress-timed and the syllable-timed group.' (Low and Grabe 2002: 1) The measurements for Welsh, BrE and SE are the following:

language	%V	ΔV	ΔC	nPVI-v	rPVI-c
Welsh	46.1	39.4	48.5	48.2	54.7
BrE	41.1	46.6	56.7	57.2	64.1
SE	46.9	41	47	52.3	68.2

Table 2.2. Rhythmic measurement values for Welsh, BrE, and SE as provided by Low and Grabe 2002. The table includes %V, ΔV, ΔC, nPVI-v, and rPVI-c.

2.5.3. Gibbon and Gut 2001: RR

Gibbon and Gut argue that at least 'two measures are presumably required' to measure rhythm: 'first, a strong-weak measure (e.g. relative syllable duration), second, a measure for the temporal window' (Gibbon and Gut 2001: 96). They modify the PVI and change its range to 0-100. This altered version of PVI is referred to as RR, Rhythm Ration. They apply this measurement strategy to syllable and vowel durations. Another new strategy in their research is FNM, Focal-Nonfocal Measure, which predicts typical focal and non-focal units. These terms refer to the binary labels such as long and short syllable, vowel and consonant, or high and low pitch. Final syllables were excluded in order to avoid artifacts.

Gibbon and Gut focus on BrE, Nigerian English, and Ibibio. Ibibio was represented by two speakers reading ten sentences (each containing at least 12 syllables). Nigerian English was represented by four speakers reading a story and one speakers retelling the same story of the length of 273 syllables. BrE data were obtained from one speaker who read and then retold the same story.

The fact the authors focused on both read and semi-spontaneous speech turned out to be very important. The speakers show differences in both syllable and vowel durations in the two styles. Furthermore, there are differences within an individual and across varieties of English related to speaking styles. They observe, as many others before them had, that '[w]hereas syllable duration does not change, vowel differences become smaller' (Gibbon and Gut 2001: 98).

The alternation to the PVI is adopted in our measurements for PVI, so that the range of values is placed on the 0-100 scale.

2.5.4. Dellwo and Wagner 2003: varco

In their study from 2003, Dellwo and Wagner address the issue of how speech rate interacts with rhythm and how it influences the results of %V and ΔC. They analysed 16 subjects: 5 for English, 4 for French, and 7 for German. The translation of a passage in German served as material providing 76 syllables. The results proved that ΔC varies with different speech rate, while %V remains relatively stable. Nevertheless, the authors also state that the influence of speech rate 'may not be strong enough [to] undermine the cluster hypothesis' (Dellwo and Wagner 2003: 473).

Hence, they propose varcoΔC, a variation coefficient for ΔC, which is calculated according to the formula (ΔC * 100)/ meanC. Interestingly enough, further research of the authors showed that '[w]hile varcoΔC stays constant across all syllable rates for [French] it varies strongly in complex fashion for [German] and [English].' (Dellwo and Wagner 2003: 474) Further research was to explain this.

2.5.6. Dellwo and Wagner 2004: YARD

So, one year later, Wagner and Delwo argue that there might indeed be acoustic evidence for isochrony, but that it cannot be measured by the %V and ΔC, because these focus on syllable complexity rather than rhythm itself. However, they do accept the fact that syllable complexity is very closely related to rhythm. Apart from this objection, %V and ΔC are seen as 'not robust against the influence of articulation rate', and, allegedly, they '[have] nothing to say about rhythmic properties of the respective languages in the time domain' (Wagner and Dellwo 2004: 227). Varco does not seem to be mentioned.

Hence, the authors propose YARD, Yet Another Rhythm Determination. YARD approaches all the above-mentioned drawbacks of %V and ΔC. It normalises syllable durations and, inspired by PVI, 'does not regard vocalic and consonantal intervals separately' (Wagner and Dellwo 2004: 228).

The method was tested on a small amount of data from the BONNTEMPO database. One sentence was translated into four languages and read by the speakers at five different speech rates. The number of the speakers was as follows: 7 for English; 6 for French; 15 for German, and 3 for Italian. The authors found that normalised syllable durations show very similar results across 5 speech rates with the exception of Italian. Their next step lied in whether syllable duration can be a reliable piece of evidence of rhythmic classes. An index based on z-transformed syllable durations which was inspired by the PVI measure was calculated. This YARD index, together with other additional indexes, seems to 'mirror the traditional rhythm class distinctions' (Dellwo and Wagner 2004: 230). The results, however, are tentative, because they could be another piece of evidence of syllabic complexity rather than rhythm itself.

2.5.7. Volín and Pollák 2009: the status of sonorants

As stated above, Ramus et al. noted that vocalic intervals would appear to be crucial for rhythmic differences. Volín and Pollák suggest that sonorants and vowels are both high-energy segments, unlike consonants that are not classified as sonorants. So, they argue that the status of sonorants either as consonants or as vowels influences rhythm types. To test this, they dismiss the phonological dichotomy of vowels and consonants and adopt a new dichotomy of low- and high-energy intervals. The results should prove

> *[...] whether rhythm is perceived through some sort of a phonological module and [...] sonorants are taken as consonantal elements or whether it is precisely the amount of energy in the speech segment which will determine its role in the speech rhythm patterning.* Volín and Pollák 2009: 1544

Sonorants are thus assigned either HE or LE 'depending on their specific properties at a given moment' (Volín and Pollák 2009: 1544).

The data used in the first study consist of 1 Czech and 1 English recording of news by a national radio station by male professional news readers. The length of each is approximately 500 words and 3.5 minutes. The second study is based on six additional recordings (three czech and three English) of the same sort. %HE (=%V), ΔLE (=ΔC), PVI-HE (=PVI-V), and PVI-LE (=PVI-C) were calculated.

The results showed that the rhythmic type of the two languages indeed shifts. The authors suggest that further research based on non-read material as well as perceptual research are necessary.

2.5.8. Ferragne and Pellegrino 2004: rhythm and British dialects

Ferragne and Pellegrino (2004a) focus on Celtic Englishes, on vowel reduction and durational features in particular. *The British Isles Corpus* was used for the analyses, consisting of 20 speakers (10 female, 10 male) from 14 regions, who read a passage of about 430 syllables.

Various metrics were calculated (meanV; meanC; %V; ΔC; ΔV; varcoC; varcoV; mean_rpviv; mean_npviv; med_rpviv; med_npviv; SR). The authors claim that 'the dialects of the Celtic countries (except for Wales) exhibit the lowest values' for ΔV (Ferragne and Pellegrion 2004: 2). VarcoV showed smaller differences than ΔV. The authors explain this by the fact that varcoV normalises speech rate. Although their respondents read the same texts, they admit that 'some speakers adopted a somewhat theatrical elocution, which the sailor passage is prone to induce' (Ferragne and Pellegrino 2004: 4). The results would appear to support the hypothesis that Celtic Englishes are indeed more syllable-based than English Englishes. Most importantly, Ferragne and Pellegrino conclude by suggesting that 'with the method employed, more significant results are very likely not attainable.' (Ferragne and Pellegrino 2004: 5).

Apart from this, the research also seems to suggest that tempo could be dialect specific.

2.5.9. White and Mattys 2007: measures of rhythmicity, their reliability and correlation with speech rate

In their paper, White and Mattys compared the following measures of rhythmicity: nPVI-v, rPVI-c, %V, ΔV, ΔC, varcoV, and varcoC. The aim of the study was to show how well the metrics illustrate different rhythm types as presented by English and Dutch, and French and Spanish (both by native and non-native speakers). For each language condition, six speakers were recorded and analysed. Each respondent read five sentences.

Their study showed that varcoV and nPVI-v are the most reliable rhythmic measures, both being normalised for speech rate, while the consonantal metrics gave various results, which is explained by different phonotactics of the languages and the influence of speech rate (the latter being the case for ΔC).

There was little correlation between %V and speech rate; nevertheless, the results of this metric did not confirm what was expected. The values obtained for varcoC presented 'no suggestion

of a systematic pattern reflecting rhythm classes' (White and Mattys 2007: 510). The measure r-PVI-c was interpreted as reflecting syllable complexity rather than rhythm classes.

Let us conclude this section by saying that although there have been debates about which measure of rhythmicity is the most appropriate one, since the debates have not terminated in a satisfactory way, all of them are still used in research on rhythm (see e.g. Ordin et al. 2011 or Chen and Zechner 2011) and will be used in the present paper as well.

3. Methodology

3.1. Respondents

3.1.1. Selection

Each variety is represented by four respondents, whose age ranges from 29 to 39 in case of Aberystwyth and 35-39 in case of Cardiff. This particular time span of ten years was chosen for merely practical purposes as most of the people willing to be recorded at the given time were of that age. The same reasons made it difficult especially for the group in Aberystwyth to be homogeneous as far as the variable of education is considered.

RESPONDENT	AGE	WELSH	TIME SPENT BEYOND CARDIFF	EDUCATION
NCWA	35	NONE	x	MA
ACWA	35	NONE	3 years in Bristol	BSc, biology
KCWA	38	NONE	x	MSc
PCWB	39	NONE	none	x

Table 3.1. Social Variables for the Respondents from Cardiff. The first three respondents are female; the fourth is male. They are arranged from the youngest to the oldest. The cross indicates that the respondent did not provide the information in the questionnaire.

CODE	AGE	WELSH	TIME SPENT BEYOND ABERYSTWYTH	EDUCATION
SAWA	29	NONE	NONE	x
MAWA	30	NONE	1 year in Llanelli (age of 16-17)	college
NAWA	37	NATIVE	NONE	x
TAWA	39	BEGINNER (2^{nd} language)	lived in Yorkshire till the age of 8	PhD

Table 3.2. Social Variables for the Respondents from Aberystwyth. All the respondents are female. They are arranged from the youngest to the oldest. The cross indicates that the respondent did not provide the information in the questionnaire.

Tables 3.1 and 3.2 provide an overview of the respondents with the variables of age, whether they speak Welsh, if they spent a longer period beyond Aberystwyth or Cardiff, and that of education. Gender is reflected in the last letter of the code of each respondent. ‘A’ stands for a female respondent, ‘B’ for a male one. There is thus only one male respondent in our sample. The region can be seen in the second letter, A standing for Aberystwyth, C for Cardiff.

TAWA claimed to suffer from a moderate speech disorder. In her questionnaire, she mentioned she had attended speech therapy for 6 months to address a lisp. This does not seem to be reflected in the results.

3.2. Data

3.2.1. The Process of Recording the Data

The respondents were recorded with Edirol R-09HR, which was placed in a distance of at least 80 cm from the speakers' mouth. The amplitude of the recordings, however, differs according to the variable intensity with which each respondent spoke. For the approximate schemes of the places where the respondents were recorded, see Appendix 1: place of recording.

It should be stated here that the conditions for the fieldwork in Aberystwyth were far from ideal. The respondents had to be recorded in various places and under various circumstances for practical reasons, one of them being simply the fact that they were willing to be recorded only while officially working. For more details about the places, see Appendix 1. This issue is connected with the amount of dysfluencies in the read English of the speakers. Since they had a limited amount of time, it was not always possible to ask them to read a sentence that they had formerly read with a dysfluency one more time, or even more often in case their correction still contained a dysfluency (alternation or hesitation).

3.2.2. Type of Data Recorded

The speakers read two pages of BBC news (formal style). See Appendix 2: reading material. The text was chosen in order for the data to be directly comparable with the study of RP (and Czech) by Volín and Pollák from 2009.

The reading itself was followed by a short conversation (informal style) in form of an interview of 10-20 minutes on various topics (usually family, hobbies, and cooking). Most of the speakers were also asked for their version of Cinderella during the conversation, and the interview questions were frequently meant to elicit a longer uninterrupted speech material, though not at all costs so that the conversation seemed as natural as it possibly could under the given circumstances. The method used is therefore somewhere in between the narrative (Cinderella), the interview (eliciting longer stretches of speech), and actual conversation, in which both parts take an equal amount of time, making the conversation less artificial. This procedure provided different styles, which was the aim.

Only the formal style, however, is analysed in the present paper because of the reasons of time and space.

3.2.3. Processing the Data

Raw Material

The recordings were labelled with specific codes and the reading recordings were split in two parts according to the BBC presenter in question (JLA for Jackie Leonard and JAA for Jill Anderson).

Sony Sound Forge Audio Studio 8.0 was used to convert the material from the stereo to the mono mode, after which it was resampled to the sampling rate of 32,000 Hz, with the interpolation accuracy being 4, and with an anti-alias filter applied.

Raw Segmentation

Each recording was segmented in PRAAT (Boersma and Weenink (2011)) into individual breath units, or breath groups (BGs), according to the inhalation of the respondents. The minimum duration for a BG to be taken as such was 1.2 seconds. This was chosen purely for practical reasons since shorter or longer stretches of speech are awkward to analyse. In case a BG was shorter than that, it was subsumed under another BG with the following criteria taken into consideration:

I. prosodic boundary
II. syntactic structure

The first does not require any further comment. Nevertheless, the second could be overruled by the first as BGs often happen to occur even in the middle of a noun phrase.

In some cases, the BGs were not indicated by an audible inhalation. When this occurred, the criterion of

III. length

had to be relied on: it would hardly, or at least rarely, be possible for a BG to be longer than 15 seconds. The first two criteria were then used for the placement of the boundaries.

Manual Segmentation

The Penn Phonetics Lab Forced Aligner (Yuan-Liberman 2008) was used to estimate the boundaries between the individual segments in BGs. As this method is not as reliable as necessary, the placement of the boundaries had to be checked, and often done, manually. The segmentation conventions were those mentioned in Machač and Skranitzl 2009 with the exception of the closure phase of plosives in post-pausal position. The duration of the closure of these was taken to be 20-30 ms.

Machač and Skarnitzl unfortunately do not comment on devoiced vowels. We decided to treat devoiced schwa in a way very similar to Low and Grabe 2002. As Low and Grabe explain, devoiced vowels are realised by friction noise and thus 'do not exhibit the formant patterns which characterise voiced vowels' (Low and Grabe 2002: 5). The authors marked these vowels as vowels only in case the acoustic signal showed evidence of their really being present. The same was done in the manual segmentation for this research except that acoustically non-visible devoiced vowels were assigned the duration lower than 0.007 ms. The same was done by Ferragne and Pellegrino 2004a; however, they do not mention how long the interval assigned to such cases was.

Silences within the BGs were considered pauses only if at least 1.2 seconds long. In case a BG contained a pause which was shorter than 1.2 seconds, it had to be divided in the middle. The first half was allotted to the previous segment, the latter to the following one.

Problematic BGs

In the manual part of the segmentation, all dysfluencies, hesitations, and alternations that could possibly influence the results were marked as {dsfl}, {hesit}, and {alt}. Errors in the speech signal were marked as {ssc}. Three stages followed.

In the first one, the results for all BGs were obtained. In the second one, only those BGs containing {dsfl}, {hesit}, {alt}, or {ssc} that exhibited highly different results for the metrics were excluded from the analyses. The last stage obtained the results for only those BGs that contained none of the dysfluencies, etc. The number of total BGs, vocalic, and consonantal intervals for each respondent is presented in the tables below both before and after discarding the BGs seen as problematic:

respondent	BGs total	n voc	n cons	discarded BGs	BGs remaining	n voc	n cons
NCWA	70	1650	1717	0	70	1650	1717
ACWA	98	1572	1715	13	85	1405	1528
KCWA	72	1632	1706	0	72	1632	1706
PCWB	78	1610	1739	4	74	1569	1692
SAWA	55	1645	1740	4	51	1646	1555
MAWA	71	1617	1723	1	70	1592	1696
NAWA	92	1610	1734	6	86	1542	1661
TAWA	103	1621	1732	0	103	1621	1732

Table 3.3. Number of BGs, number of vocalic intervals, and number of consonantal intervals before and after discarding the selected problematic BGs, i.e. the BGs containing {dsfl}, {hesit}, {ssc}, or {alt} and showing different results.

respondent	BGs total	n voc	n cons	discarded BGs	BGs remaining	n voc	n cons
NCWA	70	1650	1717	9	61	1452	1512
ACWA	98	1572	1715	26	72	1152	1256
KCWA	72	1632	1706	29	43	846	886
PCWB	78	1610	1739	15	63	1117	1199
SAWA	55	1645	1740	23	32	864	917
MAWA	71	1617	1723	38	33	632	672
NAWA	92	1610	1734	19	73	1272	1360
TAWA	103	1621	1732	10	93	1424	1519

Table 3.4. Number of BGs, number of vocalic intervals, and number of consonantal intervals before and after discarding all the BGs seen as problematic, i.e. any BG containing {dsfl}, {hesit}, {ssc}, or {alt} and showing different results.

Both tables might serve research related to dysfluencies and rhythm.

3.3. Rhythm Measurements

The next step consisted in extracting the values for duration of consonantal and vocalic intervals. To do this, several scripts were used which had been produced by the staff of the Department of Phonetics and Phonology, Charles University, Prague.

Each consonant and vowel was mapped onto symbols C and V in the following way by the first script:

string CCCVC → CVC

The last two scripts used provided the measurements of nPVI-c, nPVI-v, n cons, and n voc according to Low and Grabe (with the modification proposed by Gibbon and Gut) and those of %V, mean C, ΔC, and n cons according to Ramus et al. These scripts were run for each BG.

Varco C was calculated in Excel.

The results were taken also for all the BGs including the BGs seen as problematic to see to what extent the exclusion of the BGs changes the results.

Final syllables were included. Initial glides were included as well. Sonorants were labelled as consonants.

3.4. The Aims of this Study

The present study aimed to

I. obtain the usually calculated values for rhythmicity for the Welsh English samples
II. compare the values of the respondents from Aberystwyth with those from Cardiff
III. compare the values of the respondents from Wales with the results for RP as measured by Volín and Pollák in 2009
IV. comment on how the measures used differ in the values and which of the measures seems to be to most sensitive indicator of the rhythmic differences for the purposes of this study

3.5. Hypotheses

Hypothesis 1

The respondents from Cardiff are expected to show values indicating a stronger tendency towards stress-timing than the respondents from Aberystwyth.

Hypothesis 2

The respondents from Cardiff and Aberystwyth are expected to show values indicating a stronger tendency towards syllable-timing than the respondents representing RP.

Hypothesis 3

Since NAWA was the only one who stated her native tongue was Welsh, she was expected to display values indicating the strongest tendency towards syllable-timing.

Hypothesis 4

If the metrics measure the same aspect of language, the results should be analogical.

4. Results

The first part of this chapter presents the results for the eight Welsh respondents and makes a comparison. As will be demonstrated, the results are somewhat difficult to explain for some of the speakers. The measurements for the Welsh speakers are then contrasted with those presented in Volín and Pollák in 2009 for RP (and Czech) in the second part of the chapter.

4.1. Welsh English

This section presents the results of the selected rhythm measurements as regards AE and CE. The overall results can be seen in the tables below (Tables 4.1, 4.2, and 4.3).

respondent	nPVI-c	nPVI-v	%V	meanC	ΔC	varcoC
NCWA	36.4	42.7	43.9	103	53.3	51.8
ACWA	39.5	43.9	42.2	128.9	73.9	56.9
KCWA	39	46.3	41.9	107	60.7	56.8
PCWB	38.1	37.5	43.6	108.6	62.5	56.9
SAWA	37.9	36.7	43.9	111	69.7	61
MAWA	37.5	47.4	44.6	108.6	62.1	56.8
NAWA	39.6	40.5	39	123.6	70.4	56.4
TAWA	39.7	44.1	40.4	104.3	56.8	54.6

Table 4.1. AE and CE, overall results with all BGs. The values of nPVI-c, n-PVI-v, %V, ΔC, and ΔV for the respondents from Cardiff (NCWA, ACWA, KCWA, PCWB) and Aberystwyth (SAWA, MAWA, NAWA, TAWA). Apart from rhythmic measurements values, the table also includes meanC for any further research taking this into consideration.

respondent	nPVI-c	nPVI-v	%V	meanC	ΔC	varcoC
NCWA	36.4	42.7	43.9	103	53.3	51.8
ACWA	36.7	43.2	42.1	125.6	68.7	54.7
KCWA	38.7	45.8	41.9	107	60.4	56.5
PCWB	37.4	37.3	43.8	106.9	58.8	55.1
SAWA	37.1	36.2	43.9	109	62.6	57.3
MAWA	37.3	47.5	44.6	108.2	61.2	56.3
NAWA	38.2	39.8	38.8	122.7	68.3	55.2
TAWA	39.7	44.1	40.4	104.3	56.8	54.6

Table 4.2. AE and CE, overall results with the discarded selected BGs seen as problematic. The values of nPVI-c, n-PVI-v, %V, ΔC, and ΔV for the respondents from Cardiff (NCWA, ACWA, KCWA, PCWB) and Aberystwyth (SAWA, MAWA, NAWA, TAWA). Apart from rhythmic measurements values, the table also includes meanC for any further research taking this into consideration.

respondent	nPVI-c	nPVI-v	%V	meanC	ΔC	varcoC
NCWA	36	42.8	43.9	102.5	52.3	51.1
ACWA	38.2	43.6	42.2	124.6	66.8	53.6
KCWA	38.8	46.6	41.9	109.3	60.8	55.7
PCWB	37.5	37.7	44.1	105.4	57.1	54.4
SAWA	36.9	37.5	44.2	107.8	60.8	56
MAWA	38	51.1	44.4	110.5	62	55.7
NAWA	38.2	40.1	39.3	121.1	67	54.9
TAWA	40.1	44.4	40.2	103.9	56.6	54.6

Table 4.3. AE and CE, overall results with non-problematic BGs. The values of nPVI-c, n-PVI-v, %V, ΔC, and ΔV for the respondents from Cardiff (NCWA, ACWA, KCWA, PCWB) and Aberystwyth (SAWA, MAWA, NAWA, TAWA). Apart from rhythmic measurements values, the table also includes meanC for any further research taking this into consideration.

Each measure from table 4.3. is presented separately below for the sake of clarity. The quantities related to vowels and those related to consonants are grouped together respectively so that a comparison of different metrics used for the same group is easily accessible.

4.1.1. Vocalic Measurements

The following tables provide nPVI-v and %V for the eight respondents.

The results are arranged from the smallest to the highest values for nPVI-v so that the placement of the speakers on the syllable-based – stress-based scale is clear. The lower the number, the more syllable-timed the variety should be. So, the speakers with the most syllable-timing values should be on the left for nPVI-v and those with the most stress-timing values on the right.

In case of %V, the highest values are on the left and present the syllable-based end of the rhythm-type scale.

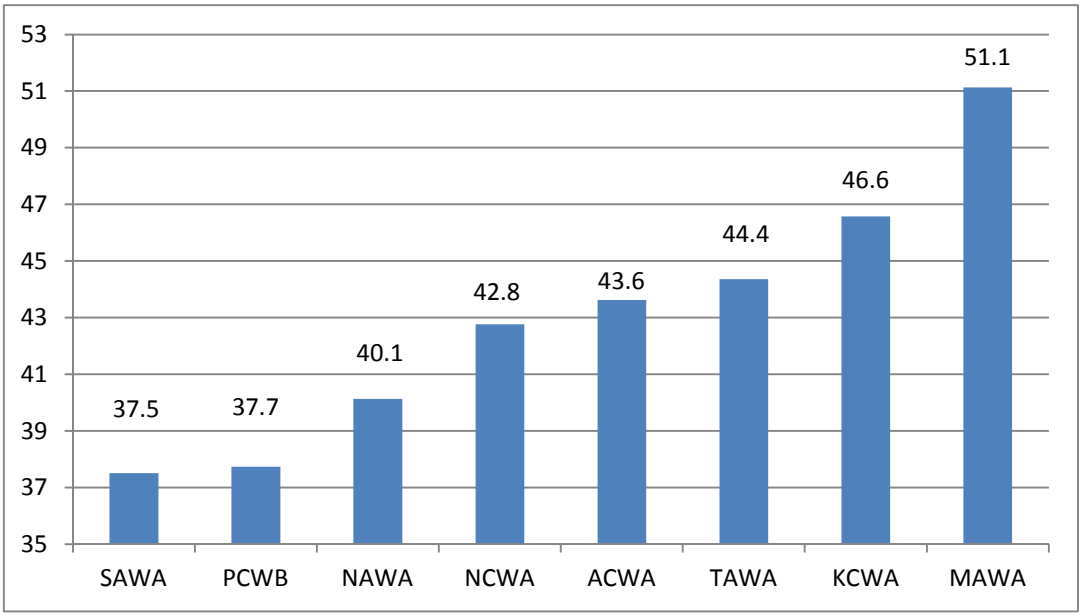

Figure 4.1. AE and CE, nPVI-v. The values for the nPVI-v measure for the eight respondents. The syllable-based end of the scale is the left side of the figure; the stress-based end of the scale is the right side; t (63) = 3.98; p < 0.01.

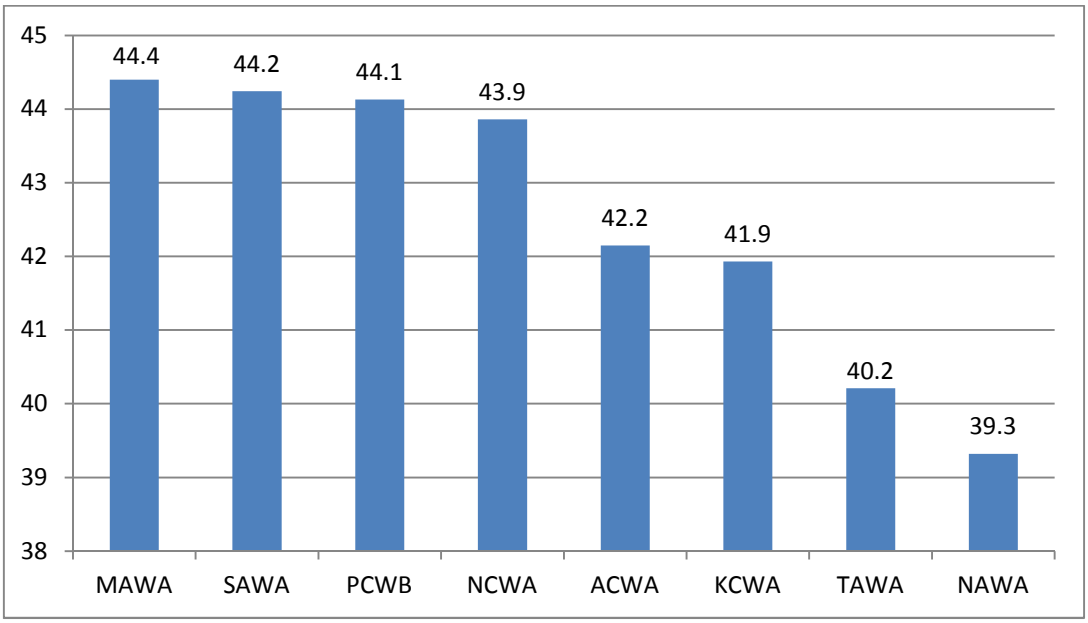

Figure 4.2. AE and CE, %V. The values for the %V measure for the eight respondents. The syllable-based end of the scale is the left side of the figure; the stress-based end of the scale is the right side; t (104) = 4.318; p < 0.01.

Considering the vocalic metrics, they provide rather different results for some of the respondents and very similar for others. This is somewhat puzzling because this means that, for some speakers, both metrics would appear to be reliable indicators of rhythmic correlates, while for others the interpretation must be more difficult.

Contradicting Results: MAWA* and *NAWA

According to nPVI-v, MAWA is the most stress-based; however, according to %V, she is the most syllable-based (i.e. more than NAWA, who should be the most syllable-based). This suggests that nPVI-v is a more reliable measure of rhythmic correlates for rhythm across dialects.

Another striking result is the fact that NAWA exhibits the lowest values for %V, which means that the only native speaker of Welsh should have the most stress-based values for vowels (which should not be the case); whereas according to nPVI-v NAWA is the third most syllable-based. This, again, seems to suggest that nPVI-V is a more reliable vocalic measure.

The %V results for NAWA will be discussed briefly again in the section dealing with consonantal measurements.

Consistent Results: SAWA, NCWB, PCWB

According to %V, NCWA, SAWA, and PCWB have almost identical values inclined towards the stress-timed end of the scale. However, according to nPVI-v, SAWA and PCWB cluster together at the syllable-timed end of the scale much more clearly (37.5 and 37.7 respectively), and NCWA is further to the stress-timed end (42.8).

Results Supported by Both Metrics

ACWA and NCWA stay rather consistent when the two metrics are compared. KCWA shows more stress-timing for nPVI-v than for %V, but still remains one with the values inclined most to stress-timing.

ACWA and KCWA exhibit fairly similar values especially for %V. The generally small difference would appear to be logical since the two respondents are sisters with a very good relationship. Nevertheless, this observation may as well be irrelevant for our purposes because the same family affiliation does not necessarily imply highly similar values. Moreover, according to nPVI-v, KCWA shows more stress-timing.

The results for TAWA are supported by both metrics.

Aberystwyth vs Cardiff

At first sight, there seems to be no indication of CE speakers to cluster together, nor for AE speakers. Nevertheless, this may not necessarily be the case when taking certain sociological aspects into account. Considering only the respondents from Cardiff, their %V values range from 44.1 to 41.9 – a difference of only 5%. The respondents from Aberystwyth range from 44.4 to 39.3 – a difference of 11.4%. In case of nPVI-v, AE again shows a higher range: 27% for AE and 17.2% for CE. This will be further commented upon in Discussion.

The consonantal measures will now be compared, after which they will be contrasted with the results for vocalic intervals briefly.

4.1.2. Consonantal Measurements

The following tables provide nPVI-c, ΔC, meanC, and varcoC. The results are again always arranged from the smallest to the highest values so that the placement of the speakers on the syllable-based – stress-based scale is readily available (the more to the left, the more syllable-based).

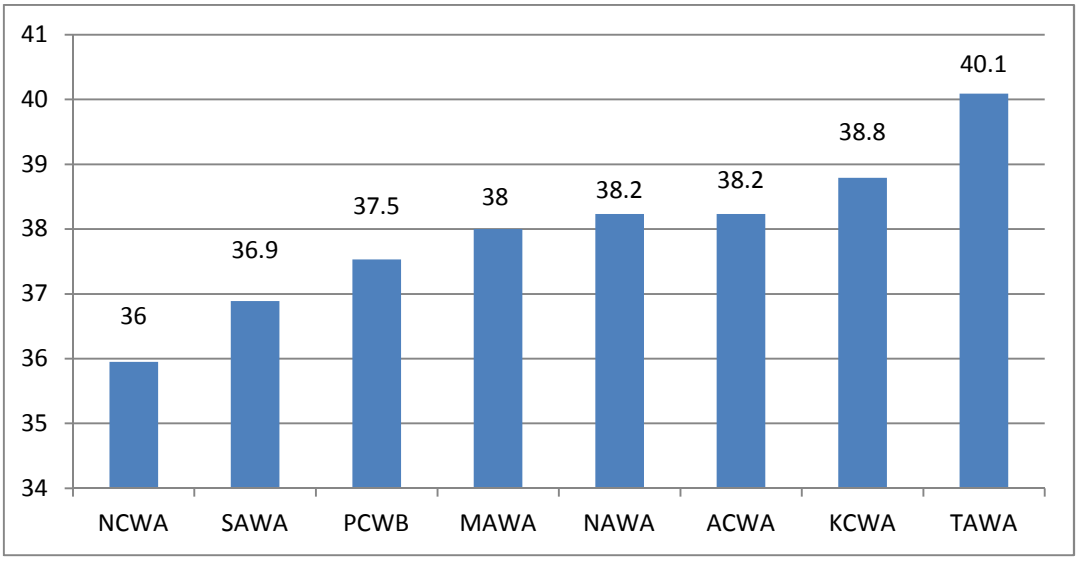

Figure 4.3. AE and CE, nPVI-c. The values for the nPVI-c measure for the eight respondents. The syllable-based end of the scale is the left side of the figure; the stress-based end of the scale is the right side; t (152) = 3.33; p < 0.01.

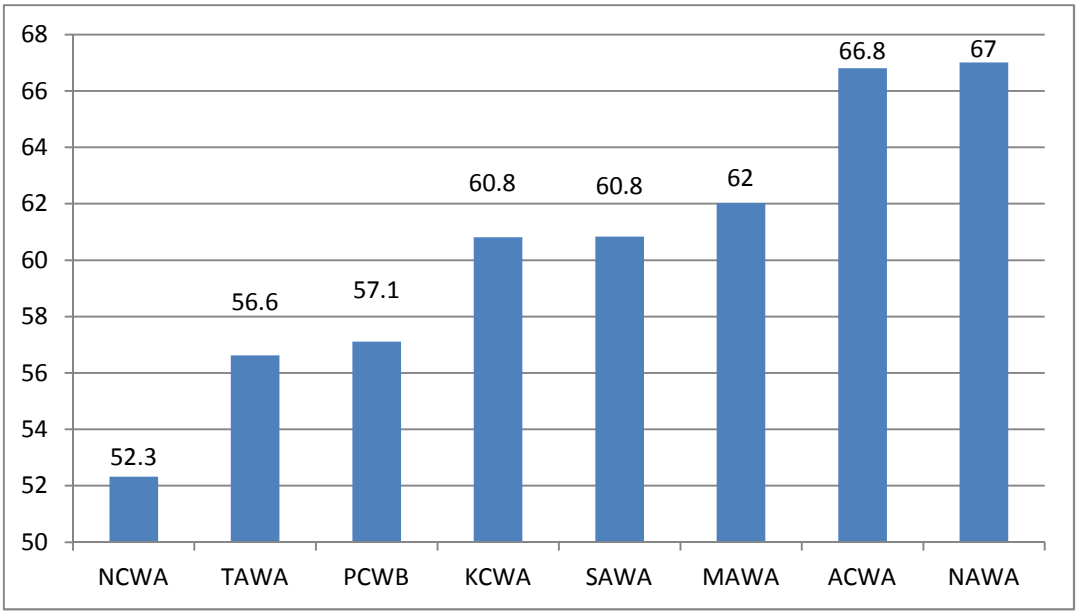

Figure 4.4. AE and CE, ΔC. The values for the ΔC measure for the eight respondents. The syllable-based end of the scale is the left side of the figure; the stress-based end of the scale is the right side; *t* (132) = -5.414; *p* = 0.

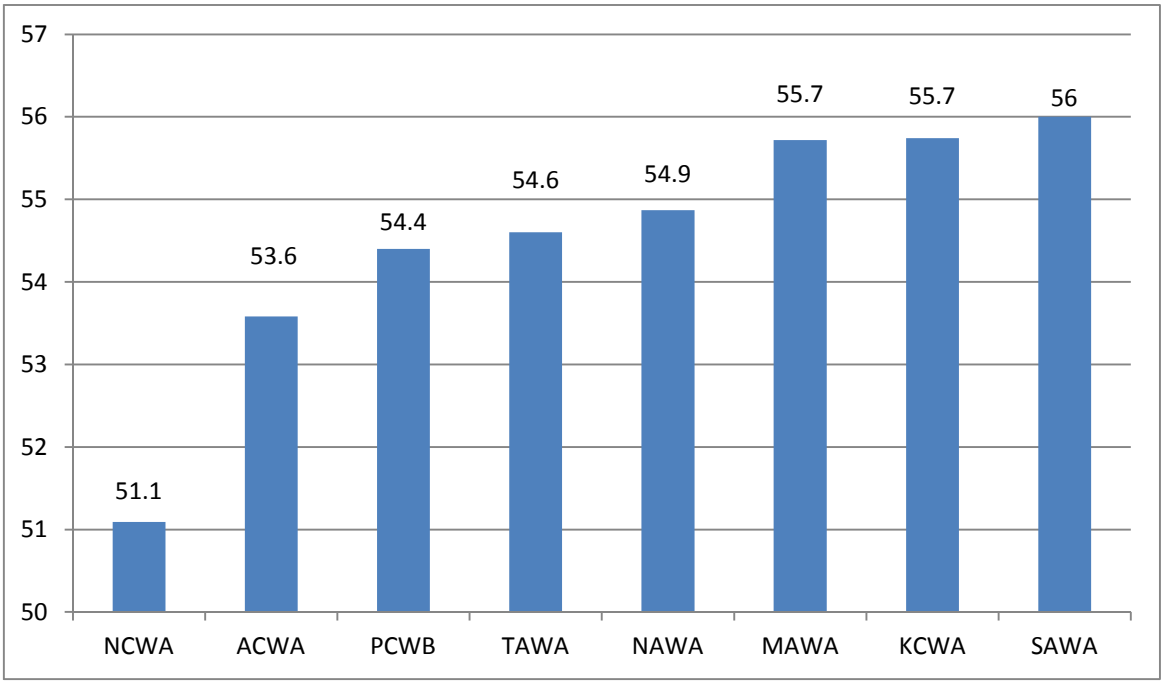

Figure 4.5. AE and CE, varcoC. The values for the varcoC measure for the eight respondents. The syllable-based end of the scale is the left side of the figure; the stress-based end of the scale is the right side; t (91) = -2.69; *p* < 0.01.

The three consonantal measures (nPVI-c, ΔC, and varcoC) display again very comparable results for some of the speakers, but very different for one, while the rest may be more difficult to interpret.

Results Supported by the Metrics

NCWA always shows the lowest values, which seems to be a very consistent result. NCWA, PCWB, and SAWA cluster together only in case of nPVI-c.

Inconsistent Results

NAWA, TAWA, SAWA, ACWA, and even KCWA seem to jump from one end to the other in a non-systematic way for the three measures. KCWA and ACWA, the two sisters, cluster together only for nPVI-c with the values of 38.8 and 38.2 respectively.

SAWA is presented as the most stress-timed according to varcoC, which is the opposite of what there is for nPVI-c.

According to ΔC, NAWA, the only Welsh speaker, should be the most stress-timed respondent. VarcoC and nPVI-c place her more or less in the middle of the scale. NAWA might again seem difficult to explain, as, according to the three measures, she should be one of the most stress-based speakers, especially according to ΔC and PVI-c. We believe this might be accounted for by certain segmental characteristics, some of which may be shared by the other respondents to a variable extent. This issue is dealt with in Discussion.

Comparing the results for both vocalic and consonantal measures, nPVI-v suggests results that would seem more logical. The measure nPVI-c would appear to support nPVI-v. ΔC gives rather inconsistent values.

4.2. WE and RP

The second section of this chapter compares the results of our analysis with those of Volín and Pollák from 2009, who analysed rhythm of selected BBC presenters.

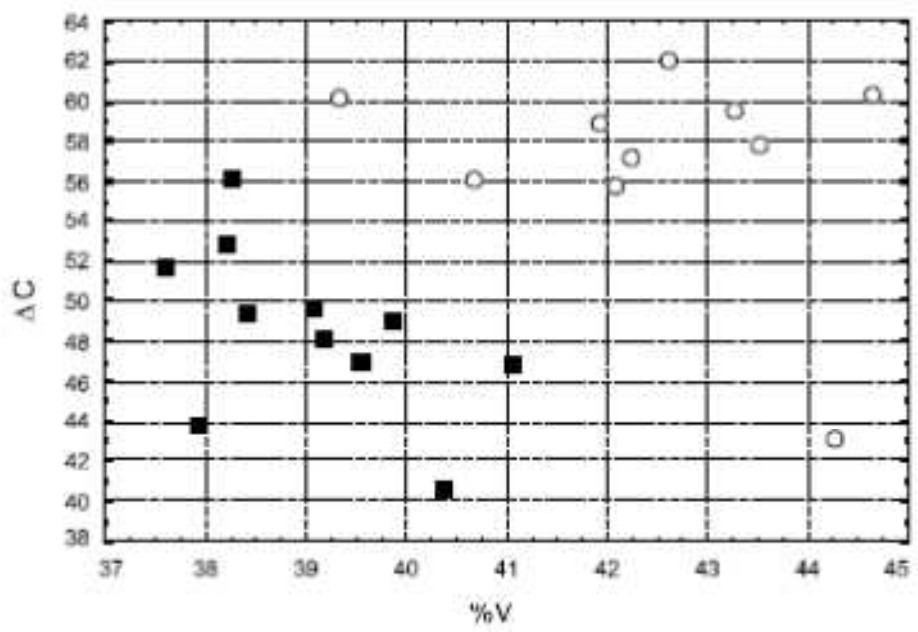

Figure 4.6. The values for the rhythmic measures ΔC and %V as provided by Volín and Pollák for RP and Czech. Volín and Pollák 2009.

The figure combines %V and ΔC by plotting them in a two-dimensional space in order to show the placement of the speakers on the scale when both consonantal and vocalic durations are taken into account. Czech is represented by squares and RP by circles. The scheme presents Czech as more stress-based than English according to %V (the lower the values for %V, the more stress-based; the higher the values for ΔC, the more stress-based). This is reversed when high-energy segments are counted as vowels.

Figure 4.7. below is a plot of the results for the respondents from Aberystwyth and Cardiff. It combines the metrics of Figure 4.6. so that a direct comparison is possible.

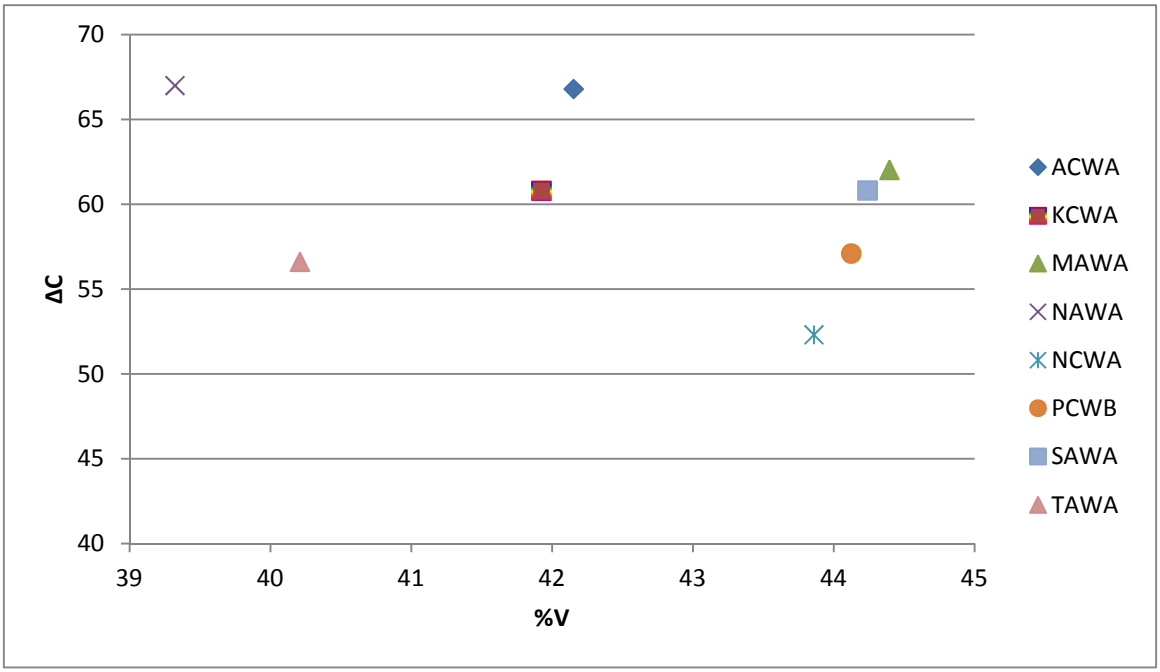

Figure 4.7. AE and CE, ΔC and %V. A plot combining the ΔC and %V values for the eight respondents. They are represented in the same way as in Volín and Pollák 2009 so that a direct comparison is possible.

The results of %V suggest that the values for AE and CE are very similar to those obtained for RP. Regarding ΔC, only ACWA and NAWA show higher values than RP, which portrays them as more stress-based. Considering how the HE and LE approach changed the rhythmic portraits of RP and Czech in Volín and Pollák, it is tempting to suggest that this approach may prove to reflect reality in a much better way, especially as NAWA should be the least stress-based. The %V range for RP is 39 - 45. The range was almost identical for the Welsh respondents: 39.3 - 44.4. The exact values for RP as analysed by Volín and Pollák were not available to us.

5. Discussion

This chapter should begin with a statement that the suggestions trying to account for the results should be taken as tentative since further research is needed to tell us more.

Aberyswyth vs Cardiff and the variable of education

As mentioned in the previous chapter, the range of the values for the speakers from Aberstywyth was higher than for the speakers from Cardiff. The higher clustering result of the Cardiff respondents can be explained by the fact that this group is more homogenous than the Aberystwyth group, rather than by geographical reasons. Indeed, since we have only four respondents for each variety, nothing can be said about the geographical aspect and how it might differentiate, if at all, the two groups of the respondents.

The respondents in Cardiff present a more homogenous group for several reasons: first, the age span is only 4 years, whereas it is 10 in case of AE; second, two of the Cardiff respondents have the title of MA or MSc and one of BSc, whereas the group in Aberystwyth are more heterogeneous in this respect; third, all respondents from Cardiff could be identified as members of the same family, unlike the respondents in Aberystwyth. So, ACWA and KCWA are sisters, PCWB is ACWA's husband, and NCWA is ACWA and KCWA's cousin. Thus, it should be natural for the respondents from Cardiff to exhibit a smaller range than the speakers from Aberystwyth, which they do.

Furthermore, both metrics present TAWA as one of the most stress-based among all the respondents. This result seems to be in accordance with the fact that TAWA is the most highly educated, having obtained a PhD degree, as well as with her affiliation with Yorkshire, where she was born.

Women and overt prestige

If it is true that women should exhibit a tendency towards overt prestige and men towards covert prestige, PCWB should display the strongest tendencies towards syllable-timing at least as regards the Cardiff group. This might indeed be suggested by the values of nPVI-v. The differences between PCWB and the three female respondents from Cardiff are as follows:

PCWB: 37.7
NCWA: 42.8
ACWA: 43.6
KCWA: 46.6

Yet, these results could also indicate that PCWB may not have had the same amount of education, which might be why he chose not to fill in the information in the questionnaire. Many more respondents with the same education background would thus be needed to clarify whether male respondents exhibit stronger tendencies towards syllable-timing in Wales. The overt-covert prestige in relationship to females and males cannot be used in the present paper to shed more light on the results given by the measures.

Welsh English and RP

The results achieved for CE and AE correspond to those achieved by Volín and Pollák in 2009 for RP when the ΔC and %V metrics are considered. It is rather infelicitous that the values for PVI are not presented in their study.

Welsh English and English English

The results of the present thesis are, however, further supported by Ferragne and Pellegrino 2004b, who analysed rhythm for East Yorkshire, Inner London, and Ulster varieties of English. Their plot combines nPVI-v and rPVI-c and our results are presented here in the same way for comparison, with the exception of PVI-c, which was normalised in our research. This means that the consonantal values cannot be directly compared. The vocalic values seem to have a smaller range for the Welsh respondents with lower values indicating greater syllable-timing; nevertheless, further research is needed to tell us more. It is tricky to compare results of two dialectological studies using different data.

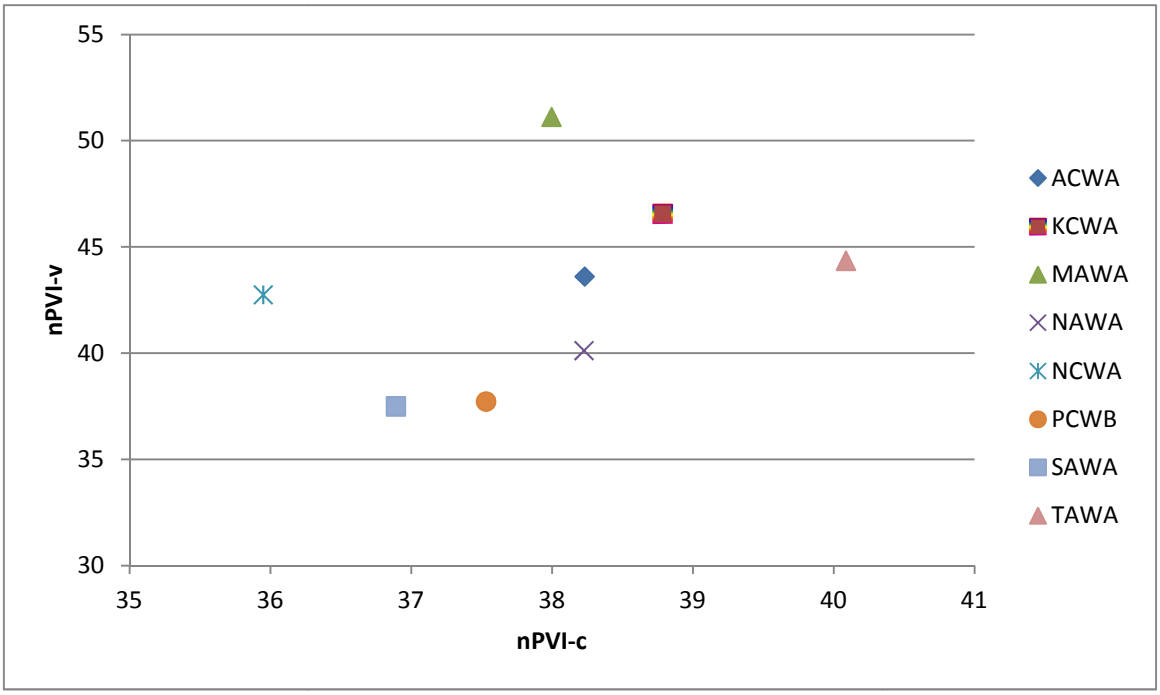

Figure 5.1. AE and CE, nPVI-c and nPVI-v. The figure presents a plot of the values of the nPVI-v and nPVI-c measurements. The higher the values, the higher the tendency towards stress-timing. The most syllable-based speakers should thus cluster in the bottom left corner.

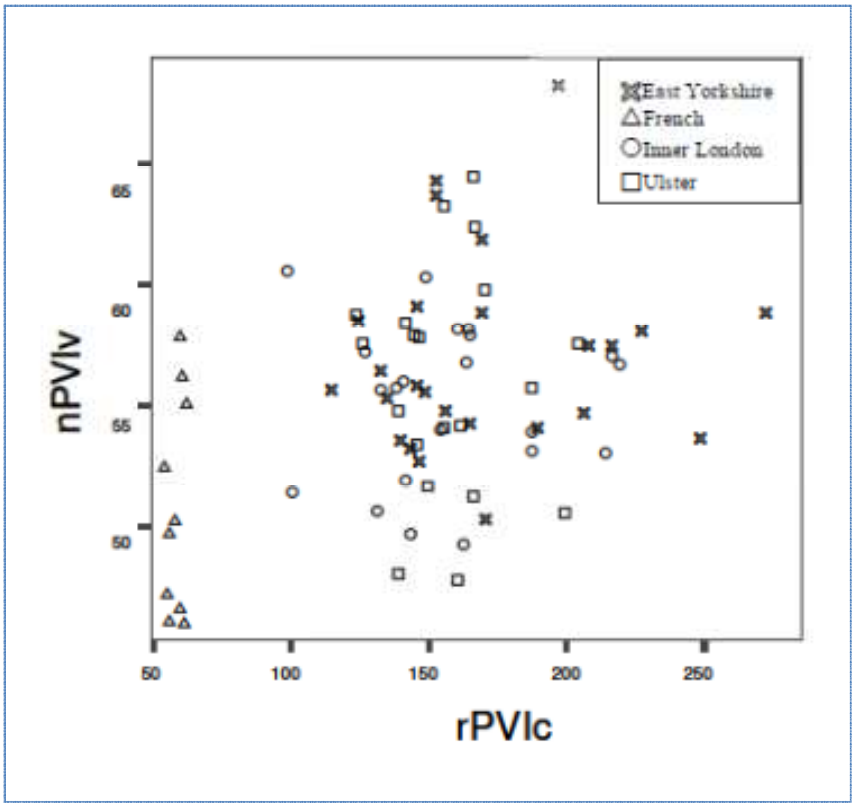

Figure 5.2. The results for the speakers of East Yorkshire English, Inner London English, Ulster English, and French for the values of the nPVI-v, nPVI-c metrics, as provided by Ferragne and Pellegrino 2004. The higher the values, the higher the tendency for stress-timing.

The authors conclude that the usual metrics do not seem to suffice to differentiate between the varieties of the same language, claiming that 'it is highly questionable whether syllabic complexity varies greatly across the dialects of British English' (Ferragne and Pellegrino 2004b: 1).

Three factors might potentially answer for this:

1. the segmentation was done automatically by the authors
2. the HE – LE approach proposed by Volín and Pollák might bring more fruitful results
3. while the claim that syllabic complexity should not vary greatly across the dialects of BrE is logical enough, the acoustic characteristics of consonantal segments of BrE dialects might indeed differ, including duration

Ferragne and Pellegrino conclude that

> *[...] duration cannot be expected to tell us more than half the story. Therefore, it is indispensable to include other acoustic cues (such as intensity and pitch) to better comprehend what rhythm is and how it can be modeled for automatic dialect identification.* Ferragne and Pellegrino 2004b: 1223

Their conclusions related to the measures used agree with our results: nPVI-v seems to be the best indicator of the acoustic correlate of rhythmic differences across dialects, whereas the consonantal measures do not provide satisfactory results.

NAWA and Acoustic Differences in Consonantal Segments

To return to consonantal differences of BrE dialects, the results for NAWA deserve further commentary here.

NAWA definitely differs from the other respondents by the fact that her /r/ is not an approximant, but a trill, which might have longer duration than the approximant of the other respondents, at least in certain positions.

Other segmental issues that could have an impact on the consonantal metrics of the Welsh respondents is the duration of voiceless plosives, which would appear to be strongly aspirated, and that of voiceless fricatives, especially that of /s/.

Breathy voice is another aspect that might influence the results, especially if the breathiness is taken once as a vocalic and once as a consonantal interval.

These are, however, mere suggestions and no measurements have been done to prove or disprove them as this is beyond the scope of the present paper.

Nevertheless, if indeed certain consonantal segments have higher values for duration in case of NAWA, the surprising result for %V could be explained by the fact that her consonantal values are higher, which makes the values for %V smaller, and thus apparently more stress-based.

Yet, with relatively small differences one has to deal with when comparing varieties of the same language, it seems difficult to see which of the metrics might be the most fruitful. We believe that three points are important for the dialectal study of rhythmicity in BrE: first, the respondents representing each variety should have similar educational background; second, careful attention should be paid to the durational differences of segments, both vocalic and consonantal; third, the acoustic analyses should be backed up by perceptual analyses since the metrics might be influenced in complex ways. Perceptual tests are also necessary for varieties the rhythm of which has not been analysed in previous research.

5. Conclusion

As suggested in Chapter 2, WE varieties have been reported as under-investigated. This relates to rhythm more than anything else. With the small number of respondents and – at least as far as we are aware – no acoustic research done for the varieties of English spoken in Aberystwyth, it seems somewhat difficult to make satisfactory conclusions about the rhythmicity of the varieties of English spoken in Cardiff and Aberystwyth even for the reading style. This makes a comparison of the five measures used considerably difficult as well. Nevertheless, we conclude that PVI-v would appear to be the most sensitive indicator of rhythmic differences for dialectological research, since %V is dependent on the proportion of consonantal intervals, and the consonantal measures may be difficult to compare for various potential dialectological differences at the level of segments. PVI-v being the most sensitive measure is supported by White and Mattys 2007.

At the end of Chapter 3, a few hypotheses were listed:

Hypothesis 1

The respondents from Cardiff are expected to show values indicating a stronger tendency towards stress-timing than the respondents from Aberystwyth.

This hypothesis has not been supported. However, with the small amount of respondents, it has not been *not* supported, either. The variable of education seems to be likely to obscure the results for the variable of location. Therefore, if homogeneity for the first is not provided for, the latter is hard to analyse.

Hypothesis 2

The respondents from Cardiff and Aberystwyth are expected to show values indicating a stronger tendency towards syllable-timing than the respondents representing RP.

This hypothesis has not been supported. The respondents show similar values measured for RP by Volín and Pollák. Moreover, two of the Welsh respondents seem to show even higher tendencies for stress-timing. However, we believe that this could be accounted for by the LE-

HE approach by Volín and Pollák, which was not conducted for the Welsh respondents in this study.

Hypothesis 3

If the metrics measure the same aspect of language, the results should be analogical.

The results have not proved to be analogical.

Hypothesis 4

Since NAWA was the only one who stated her native tongue was Welsh, she was expected to display values indicating the strongest tendency towards syllable-timing.

This was supported only by nPVI-v, and not entirely. NAWA does exhibit tendencies towards syllable-timing, but she is not the one with the strongest tendencies. As stated above, we believe the results for %V differed because of the fact that %V depends on the proportion of consonantal intervals. The results for consonants are difficult to account for, and it is tempting to suggest that this may be caused by the individual differences in the duration of particular segments.

Further Research

To shed more light on rhythmicity of WE varieties, the following propositions are made for future research:

1. Careful analyses of the acoustic characteristics of consonantal segments should be carried out in order to prove or disprove how these might influence the rhythmic portrait of the varieties for the consonantal values measured by the usual metrics. These should focus especially on aspiration and breathiness, voiceless fricatives, voiceless plosives, and approximants, which struck us as potentially unusual during the process of segmentation.

2. The research should be done with more respondents.

3. The respondents should represent more homogenous groups especially regarding education.

4. The variable of Welsh being or not being a native tongue of the respondents deserves further investigation, and taking it into account is inevitable.

5. The respondents should be recorded in a studio and better care should be taken in order for the respondents to read a text ultimately with no dysfluencies.

6. Spontaneous speech might produce more interesting, if not more realistic, results. However, such research must necessarily tackle the issue of comparability of the utterances as the respondents cannot be made to produce the same utterances spontaneously.

7. The approach introduced by Volín and Pollák in 2009 should be tested for our data as well.

8. The measurements should ideally be supported by perceptual tests.

As Ferragne and Pellegrino have observed in 2004b, it is questionable whether duration itself is the only acoustic correlate of rhythm. In the theoretical chapter, it was mentioned that He (He 2012) has proposed that intensity might be a better acoustic correlate than duration.

These statements yet remain to be proved or disproved as well.

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Czech Résumé

1. Úvod

První kapitola práce vymezuje základní oblast výzkumu, který byl pro účely studie proveden, tedy rytmické rozdíly mezi velšskou angličtinou a britským standardem.

2. Teoretická část

Druhá kapitola se dělí do tří základních částí.

Část první se zabývá čtyřmi základními přístupy k rytmu jako takovému. Nejprve se věnuje poněkud zastaralému chápání rytmu na bázi čistě fyziologické. Dále se věnuje akustickým indikátorům rytmu, a to co se týče trvání, intensity, spektra a frekvence. Následně je vysvětleno hledisko percepční, které se ukazuje být pro rytmus klíčové. Z percepce vychází také základní třídění jazyků dle rytmického hlediska na jazyky izoslabičné a izochronní. Tomuto třídění je taktéž věnována pozornost. Nakonec se část zabývá také sporným hlediskem fonologickým, a to jak z perspektivy synchronní, tak z perspektivy diachronní.

Druhá část poskytuje stručnou charakteristiku britského standardu (RP), velštiny a nakonec i velšských angličtin.

Poslední, třetí část shrnuje přístupy, kterými byl rytmus dosud měřen, a to tak, jak je podává osm vybraných studií. Těmito přístupy jsou %V, ΔV, ΔC, varco, PVI-c a PVI-v, méně častěji RR a YARD.

3. Metodologická část

Třetí kapitola uvádí údaje osmi respondentů vybraných pro dvě oblasti Walesu, Cardiffu a Aberystwyth. Popisuje, v jakých podmínkách byla data sbírána, a taktéž další zpracování získaného materiálu.

4. Výsledky

První sekce čtvrté kapitoly představuje hodnoty pro pět z výše uvedených metod pro měření rytmu pro osm velšských respondentů: %V, nPVI-v, nPVI-c, ΔC a varcoC. Pro některé mluvčí rytmické hodnoty ukazují různé hodnoty, zatímco pro jiné dosti obdobné.

Druhá sekce této kapitoly porovnává výsledky dosažené pro velšské respondenty s výsledky pro moderátory zpráv BBC, které byly přejaty ze studie Volína a Polláka z roku 2009.

5. Diskuse

Kapitola se snaží podobnosti a odlišnosti ve výsledcích alespoň do jisté míry vysvětlit a na jejich základě stanovit, která z výpočetních strategií by mohla být nejcitlivějším ukazatelem rytmických odlišností v dialektologickém výzkumu.

Výsledky se zdají bát dále podpořeny výsledky studie Ferragneho a Pellegrina, která se věnuje rytmickým rozdílům v britských nářečích a která stejně jako naše studie podotýká, že nPVI-v se ukazuje být nejcitlivějším indikátorem rytmických rozdílů pro nářeční výzkum.

6. Závěr

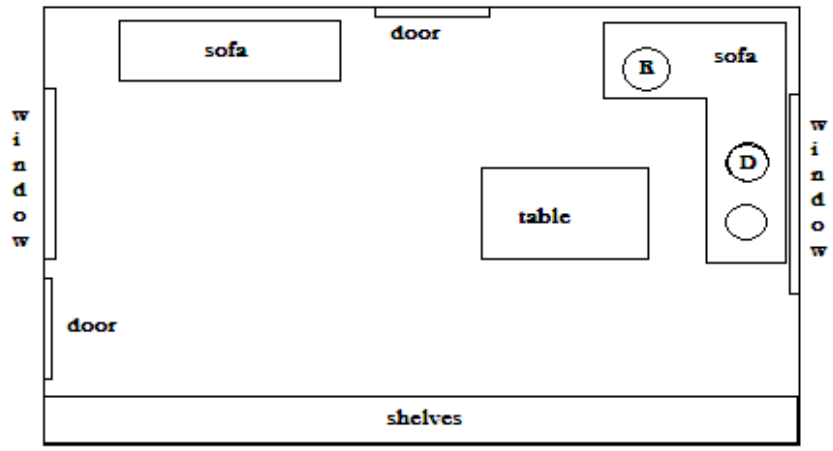
V závěru jsou shrnuta pozorování uvedená v kapitole s výsledky a v diskusi. Práce je zakončena návrhy pro další výzkum.

Appendix 1: places of recording

Ten respondents were to be analysed originally. However, it was not possible to include all ten respondents in the research because of the reasons of time. The information found below includes even these two speakers for the sake of completeness and for the sake of further research.

Cardiff

The respondents from Cardiff were recorded in the same family house. The layout of the room can be roughly illustrated with the following picture:



Picture 1. Room in Cardiff.

The walls were not covered with wallpaper. There was a net curtain covering the window behind the sofa. The sofa was made of leatherette and had pillows randomly placed on it. The table was made of wood.

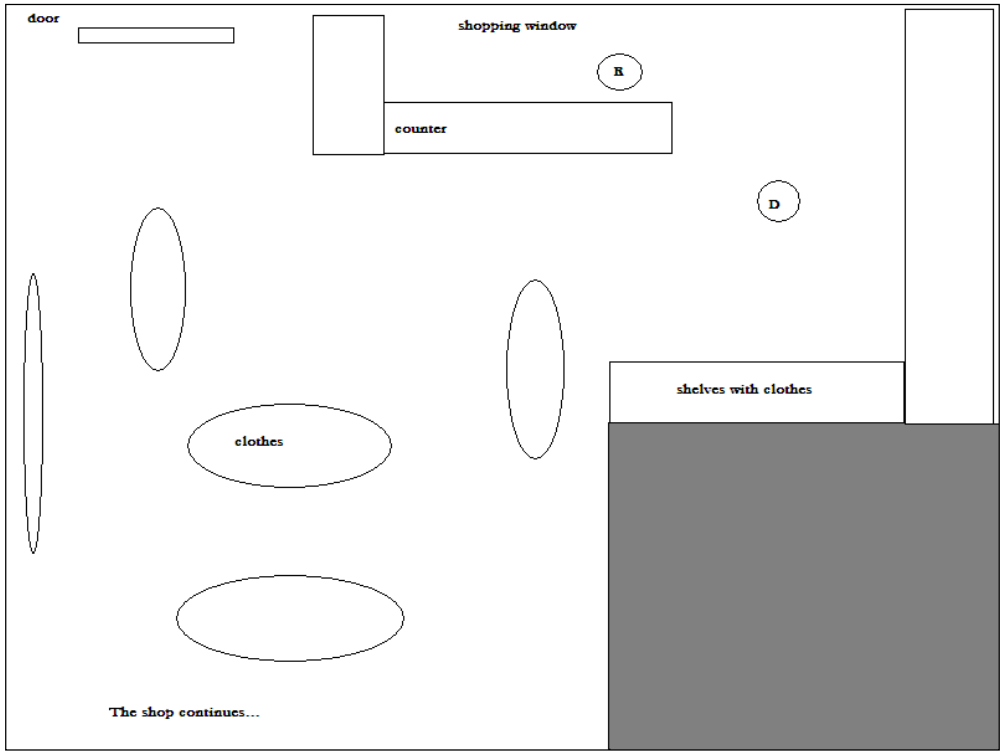
The recording device (D) was arranged on a pillow so as to make one of the channels point directly to the respondent in question (R). In case of ACWA, the pillow was placed on the table. In the remaining four instances (PCWB, NCWB, NCWA, KCWA), the pillow was placed on one of the researchers, as shown in the picture (it was always placed on the researcher who was closer to the respondent). The latter placement of the device turned out to be a rather infelicitous methodological mistake as the quality of the remaining four recording was slightly worse.

The respondents and the researches were sitting all through the recording process. One of the researchers was Czech, one was Welsh.

Although the recording was not directly disturbed by any persons entering the room, some of the sections of the recordings are influenced by sounds brought about by running up the stairs above the room or closing the front door.

Aberystwyth

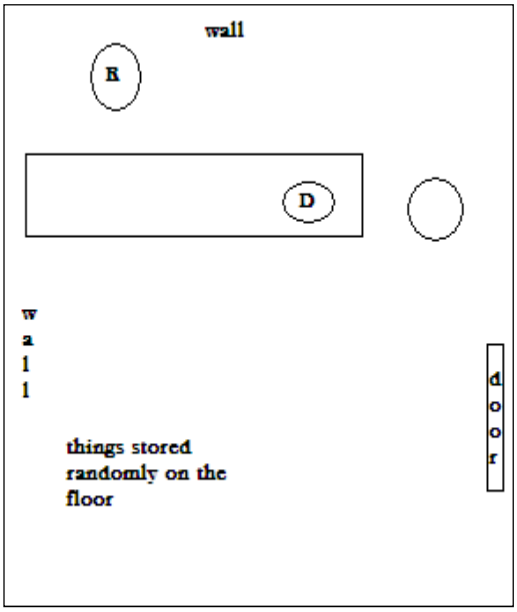
MAWA was recorded in a clothes shop, which could be schematized as follows:



Picture 2. Clothes Shop in Aberystwyth.

Both the respondent and the researcher were standing all through the recording process. The researcher was holding the recording device placed on a corduroy jacket at the level slightly below the researcher's mouth. The recording device was placed in a way allowing one of the channels to be pointed directly to the respondent. The counter was probably a particleboard. As the respondent was working and customers could have come at any time, she seemed naturally slightly nervous. During the second, conversational part of the process, the recording had to be errupted once because of a customer.

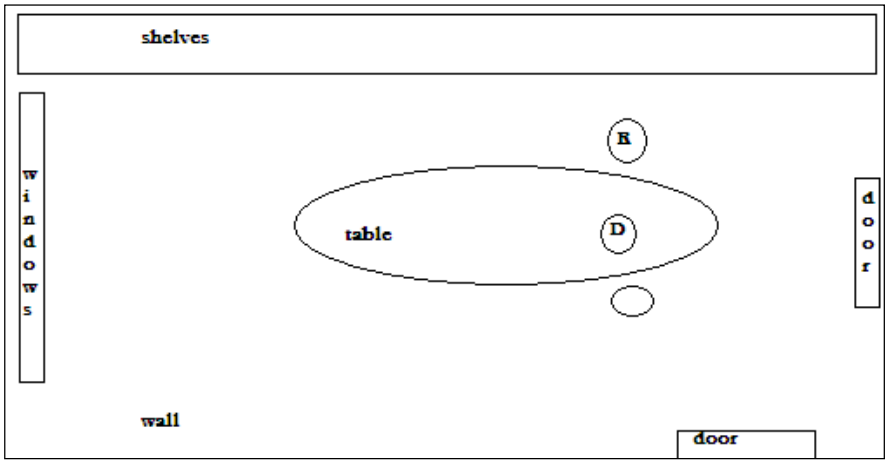
GAWB was recorded in a cellar of a music shop depicted in the picture below (the lower part of the cellar is cut here):



Picture 3. Music shop store cellar in Aberystwyth.

Both the respondent and the researcher were sitting all through the recording process. The recording device was arranged on a corduroy jacket placed on the table in a way enabling one of the channels to point directly to the respondent. The table was made of particleboard and various objects were randomly placed on it (such as cables, etc.). The walls were not covered in wallpaper. The room was fairly narrow.

SAWA, NAWA, and TAWA were recorded in a meeting room of the university shown below:



Picture 4. University meeting room in Aberystwyth.

Both the respondents and the researcher were sitting all through the recording process. The recording device was arranged on a corduroy jacket placed on a long wooden table in a way enabling one of the channels to point directly to the respondent. The walls were not covered with wallpaper. The room was fairly spacious and large. TAWA was recorded in the presence of SAWA and NAWA. SAWA was recorded in the presence of NAWA. NAWA was recorded only in the presence of the researcher. The room was quiet, but occasional turmoil on the corridor could be heard slightly.

Appendix 2: reading material

BBC news with Jackie Leonard

The former United States president, Jimmy Carter, is in the Cuban capital Havana for a five-day visit. He is the first acting or former president to visit Cuba since the country's communist leader, Fidel Castro, came to power in 1959. Daniel Schweimler reports from Havana.

The main political party in the Israeli coalition government, Likud, is discussing whether it should block any future attempts to declare an independent Palestinian state. But the Israeli prime minister, Ariel Sharon, has urged members of his party not to vote on the resolution. He said it would be against Israel's interests to rule out any future settlement, which included the creation of a Palestinian state. From Jerusalem, Michael Voss reports.

A terminally ill British woman, who lost a high-profile legal battle to allow her husband to help her commit suicide, has died. Diane Pretty, who was forty-three, had been suffering with motor neurone disease for several years. The family says she began experiencing breathing difficulties ten days ago and died at a hospice on Saturday. Diane Pretty took her case all the way to the European Court of Human Rights in an attempt to gain permission for her husband to help end her life.

You are listening to the news from the BBC in London.

There have been outbreaks of ethnic violence in Madagascar as the political deadlock continues between the newly declared president Mark Ravalomanana and his rival the long-standing president Didier Ratsiraka, who's refusing to step down. A human rights group says six people have been killed in a town in the west of Madagascar, from where Alastair Leithead reports.

The Russian government has sent a specialist civil emergency team to the Bajkonur Space Centre in Kazakhstan to reach some eight people trapped after part of the building collapsed. They were repairing the roof of one of the hangars used for assembling and testing space vehicles, when part of it crashed eighty meters to the ground. The space centre dates from the nineteen fifties and was the place where the Soviet Union launched the first man-made satellite, Sputnik.

The International Press Institute has criticized governments around the world for limiting civil liberties in the name of fighting terrorism. Delegates meeting in Slovenia issued a statement saying it was dangerous to limit civil liberties under the pretext of combating terrorism. The statement also said the struggle against international terrorism had left governments seeking dangerous controls over the free flow of information and freedom of expression.

Delegates at a conference in Bangladesh aimed at preserving one of the world's largest mangrove forests, the Sundarbans, have agreed to cooperate with conservation efforts. The Sundarbans, home to the royal Bengal tiger, is described as one of the last great coastal wetlands, but it's seriously threatened by pollution and human encroachment. The forest straddles the border between India and Bangladesh.

BBC news

BBC news with Jill Anderson

The United States Defence Secretary Donald Rumsfeld has urged NATO to go on the offensive to avert what he says is the threat of terrorist attacks with weapons of mass destruction. Mr. Rumsfeld was speaking at a meeting of NATO Defence Ministers in Brussels called to discuss reforms of the alliance. From Brussels here is Janet Barry.

President Bush is expected to announce a major restructuring of security and intelligence in the United States during a televised speech later today in response to the attacks of September 11th. The White House spokesman described it as the most far-reaching reorganisation of the federal government in more than fifty years. A BBC correspondent in Washington says the plans are expected to include the creation of a new intelligence agency to work alongside the CIA and the FBI.

The American envoy dealing with Kashmir, Richard Armitage, has expressed optimism that India and Pakistan will stop short of going to war over the disputed region. After a meeting in Islamabad with the Pakistani President, General Musharaff, Mr. Armitage quoted him as saying that he would do everything possible to avoid the conflict. The envoy said he'd be seeking similar assurances when he met the Indian leadership in Deli on Friday. Suzanna Price reports from Islamabad.

You're listening to the news from the BBC in London.

A number of big name international investors at the world economic forum for Africa summit in Durban have backed the so-called Marshall Plan for Africa or NEPAD. New partnership for Africa's development has been at the heart of discussions in forums at the summit ahead of the G8 meeting later this month in Canada. From Durban Alistair Leathhead reports.

Officials from Britain, the United States, and Libya have met in London to discuss what Tripoli needs to do for United Nations sanctions against it to be lifted. They were imposed after the bombing of an American airliner over the Scottish town of Lockerby in 1988, in which two hundred and seventy people were killed. British delegates described the talks as constructive and confirmed that Libya had recently made a compensation offer to lawyers representing families of the people killed in the bombing. Libya has denied any official connection with the offer.

France has suffered another setback to their hopes of retaining the football World Cup. In today's game they were held by Uruguay to a goalless draw, the first of the tournament. France played most of the match with ten men after the striker Tierri Henry was set off... sent off. They must now beat Denmark in their final match in Group A to stand a chance of reaching the second round. Earlier Denmark and Senegal drew one all to leave them joint top of the group with four points each.

One of the American stars of the punk rock era D D Ramon has been found dead of a suspected drug-overdose at his Hollywood home. He was fifty. D D Ramon, whose real name was Douglas Glenn Kalvin, was a founder member of the pioneering punk band The Ramons. The group never made it into the US Top Forty, but had several hits in the U.K. including their second album Ramons Leave Home and the song Sheena Was a Punk Rocker. The lead singer of the group died last year.

BBC news.

Appendix 3: consent form

The following consent form was taken and adapted from <www.paultenhave.nl/CF.doc> in January 2012. As the authors state, the form 'was developed by Susan M. Ervin-Tripp, Psychology Department, University of California at Berkeley. It is used by the UCB Committee for the Protection of Human Subjects for all studies of language use. It is provided here as an *example* of what could be included in such a form.'

Researcher name_____

LETTER OF CONSENT

AUDIO RELEASE CONSENT FORM

As part of this project we have made a photographic, audio, and/or video recording of you while you participated in the research. We will only use the records in ways that you agree to. In any use of these records, names will not be identified.

1. The records can be studied by the research team for use in the research project.

Photo _____ Audio _____ Video _____

[Please use initials]

2. The records can be shown to subjects in other experiments.

Photo _____ Audio _____ Video _____

[Please use initials]

3. The records can be used for scientific publications.

Photo _____ Audio _____ Video _____

[Please use initials]

4. The written transcript can be kept in an archive for other researchers.

Photo _____ Audio _____ Video _____

[Please use initials]

5. The records can be used by other researchers.

Photo _____ Audio _____ Video _____

[Please use initials]

6. The records can be shown at meetings of scientists interested in the study of _____

Photo _____ Audio _____ Video _____

[Please use initials]

7. The records can be shown in classrooms to students.

Photo _____ Audio _____ Video _____

[Please use initials]

8. The records can be shown in public presentations to nonscientific groups.

Photo _____ Audio _____ Video _____

[Please use initials]

9. The records can be used on television and radio.

Photo _____ Audio _____ Video _____

[Please use initials]

10. I would not mind answering further questions if necessary:

_____

[Please use initials and provide your e-mail address]

I have read the above description and give my consent for the use of the records as indicated above.

Date _____

Signature _____

Signature of Guardian, if Applicable _____

Welsh speaker _____

If so, when started learning Welsh_____

When started learning English_____

Where Welsh learnt (city or region) _____

Where English learnt (city or region) _____

Native language(s)_____

Periods spent beyond Aberystwyth/Cardiff:_____

_____

_____

_____

Any relevant information related to family members and friends_____

_____

_____

_____

Language(s) used on the tape_____

Education _____Occupation _____

Name _____ Age _____ Sex __

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_=_

[Michaela Hejná, Department of English Language and ELT Methodology, Charles University, Prague; misprdlina@gmail.com]

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